Presidential Address
ON
THE RANGE OF PHYSICAL THEORIES.

Delivered before the British Association for the Advancement of Science at Glasgow on Sept. 11th, 1901.

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LADIES AND GENTLEMEN,—The thought in the minds of all to-night is that since we met last year the great Queen, in whose reign nearly all the meetings of the British Association have been held, has passed to her rest. Her reign, glorious in many respects, was remarkable, outside these islands, for the growth of the empire; within and without them, for the drawing nearer of the Crown and the people in mutual trust; while during her lifetime the developments of science and of scientific industry have altered the habits and the thoughts of the whole civilised world. The representatives of science have already expressed in more formal ways their sorrow at the death of Queen Victoria and the loyalty and confident hope for the future with which they welcome the accession of King Edward. But none the less I feel sure that at this, the first meeting of the British Association held in his reign, I am only expressing the universal opinion of all our members when I say that no group of the King's subjects trusts more implicitly than we do in the ability, skill, and judgment which His Majesty has already shown in the exercise of the powers and duties of his august office. This meeting of the British Association is not only remarkable as being the first in the new reign—it is also the first in a new century. It is held in Glasgow at a time when the International Exhibition has in a special sense attracted the attention of the world to the city, and when the recent celebration of the ninth jubilee of the university has shown how deeply the prosperity of the present is rooted in the past. Glasgow is a city which a physicist has made for ever famous and 53 years in its history will never be forgotten while civilisation lasts. More than half a century ago a mere lad was the first to compel the British Association to listen to the teaching of Joule and to accept the law of the conservation of energy. Now, alike in the most difficult mathematics and in the conception of the most ingenious apparatus, in the daring of his speculations and in the soundness of his engineering, William Thomson, Lord Kelvin, is regarded as a leader by the science and industry of the whole world. It is the less necessary to dwell at length upon all that he has done, for Lord Kelvin has not been without honour in his own country. Many of us who meet here to-night met last in Glasgow when the University and city had invited representatives of all nations to celebrate the jubilee of his professorship. For those two or three days learning was surrounded with a pomp seldom to be seen outside a palace. The costumes of all the chief universities of the world were jostling here, the outward signs that those who were themselves distinguished in the study of nature had gathered to do honour to one of the most distinguished of them all, and Lord Kelvin's achievements were then described in addresses in every tongue.

This year for the first time we have a Section for Education, and the importance of this new departure, due largely to the energy of Professor Armstrong, is emphasised by the fact that the chair of that section will be occupied by the Vice-President of the Committee of Council on Education—Sir John Gorst. Education is passing through a transitional stage. The recent debates in Parliament, the great gifts of Mr. Carnegie, the discussion as to University organisation in the north of England, the reconstitution of the University of London, the increasing importance attached to the application of knowledge both to the investigation of nature and to the purposes of industry, are all evidence of the growing conviction that without advance in education we cannot retain our position among the nations of the world. If the British Association can provide a platform on which these matters may be discussed in a scientific but practical spirit it will contribute in no slight measure to the national welfare.

THE SCIENCE OF THE NINETEENTH CENTURY.

Two years ago Sir Michael Foster dealt with the work of the century as a whole. Last year Sir William Turner discussed in greater detail the growth of a single branch of science. A third and humbler task remains—viz., to fix our attention on some of the hypotheses and assumptions on which the fabric of modern theoretical science has been built and to inquire whether the foundations have been so "well and truly" laid that they may be trusted to sustain the mighty superstructure which is being raised upon them. The moment is opportune. The three chief conceptions which for many years have dominated physical as distinct from biological science have been the theories of the existence of atoms, of the mechanical nature of heat, and of the existence of the ether. Dalton's atomic theory was first given to the world by a Glasgow professor—Thomas Thomson—in the year 1807, Dalton having communicated it to him in 1804. Rumford's and Davy's experiments on the nature of heat were published in 1798 and 1799 respectively, and the celebrated Bakerian Lecture, in which Thomas Young established the undulatory theory by explaining the interference of light, appeared in the "Philosophical Transactions" in 1801. The keynotes of the physical science of the nineteenth century were thus struck as the century began by four of our fellow-countrymen.

DOUBTS AS TO SCIENTIFIC THEORIES.

It is well known that of late doubts have arisen as to whether the atomic theory with which the mechanical theory of heat is closely bound up and the theory of the existence of an ether have not served their purpose and whether the time has not come to reconsider them. The facts that Professor Poincaré, addressing a congress of physicists in Paris, and Professor Poynting, addressing the Physical Section of the Association, have recently discussed the true meaning of our scientific methods of interpretation, and that Dr. James Ward has lately delivered an attack of great power on many positions which eminent scientific men have occupied, are perhaps a sufficient justification of an attempt to lay before you the difficulties which surround some of these questions. To keep the discussion within reasonable limits I shall illustrate the principles under review by means of the atomic theory, with comparatively little reference to the ether, and we may also at first confine our attention to inanimate objects. A great school of chemists, building upon the thermodynamics of Willard Gibbs and the intuition of Van t'Hoff, have shown with wonderful skill that if a sufficient number of the data of experiment are assumed it is possible, by the aid of thermo-dynamics, to trace the form of the relations between many physical and chemical phenomena without the help of the atomic theory. But this method deals only with matter as our coarse senses know it; it does not pretend to penetrate beneath the surface. It is, therefore, with the greatest respect for its authors that I venture to assert that it cannot be regarded as the last word of science in the struggle for the truth. Whether we grapple with them or whether we shirk them, however much or however little we can accomplish without answering them, the questions still force themselves upon us, Is matter what it seems to be? Is interplanetary space full or empty? Can we argue back from the direct impressions of our senses to things which we cannot directly perceive; from the phenomena displayed by matter to the constitution of matter itself?

SUCCESSIVE STEPS IN THE ANALYSIS OF MATTER.

In dealing with the question of the constitution of matter and the possibility of representing it accurately we may grant at once that the ultimate nature of things is, and must remain, unknown; but it does not follow that immediately below the complexities of the superficial phenomena which affect our senses there may not be a simpler machinery of the existence of which we can obtain evidence, indirect indeed, but conclusive. The fact that the apparent unity which we call the atmosphere can be resolved into a number of different gases is admitted, though the ultimate nature of oxygen, nitrogen, argon, carbonic acid, and water vapour is as unintelligible as that of air as a whole, so that the analysis of air may be said to have substituted many incomprehensibles for one. Nobody, however, looks at the question from this

point of view. It is recognised that an investigation into the proximate constitution of things may be useful and successful, even if their ultimate nature is beyond our ken. Now, at what point must this analysis stop if we are to avoid crossing the boundary between fact and fiction? Is there any fundamental difference between resolving air into a mixture of gases and resolving an elementary gas into a mixture of atoms and ether? There are those who make the objection that molecules and atoms cannot be directly perceived, cannot be seen or handled, and are mere conceptions, which have their uses but cannot be regarded as realities. It is easiest to reply to this objection by an illustration. The rings of Saturn appear to be continuous masses separated by circular rifts. This is the phenomenon which is observed through a telescope. By no known means can we ever approach or handle the rings; yet everybody who understands the evidence now believes that they are not what they appear to be, but consist of minute moonlets, closely packed indeed, but separate the one from the other. In the first place Maxwell proved mathematically that if a Saturnian ring were a continuous solid or fluid mass it would be unstable and would necessarily break into fragments. In the next place, if it were possible for the ring to revolve like a solid body, the inmost parts would move slowest, while a satellite moves faster the nearer it is to a planet. Now spectroscopic observation, based on the beautiful method of Sir W. Huggins, shows not only that the inner portions of the ring move the more rapidly, but that the actual velocities of the outer and inner edges are in close accord with the theoretical velocities of satellites at like distances from the planet. This and a hundred similar cases prove that it is possible to obtain convincing evidence of the constitution of bodies between whose separate parts we cannot directly distinguish, and I take it that a physicist who believes in the reality of atoms thinks that he has as good reason for dividing an apparently continuous gas into molecules as he has for dividing the apparently continuous Saturnian rings into satellites. It may, however, be urged that atoms and the ether are alleged to have properties different from those of matter in bulk, of which alone our senses take direct cognisance, and that therefore it is impossible to prove their existence by evidence of the same cogency as that which may prove the existence of a newly discovered variety of matter or of a portion of matter too small or too distant to be seen. This point is so important that it requires full discussion, but in dealing with it it is necessary to distinguish carefully between the validity of the arguments which support the earlier and more fundamental propositions of the theory, and the evidence brought forward to justify mere speculative applications of its doctrines which might be abandoned without discarding the theory itself. The proof of the theory must be carried out step by step. The chemist can actually produce the elementary constituents into which he has resolved a compound mass, but no physicist or chemist can produce a single atom separated from all its fellows and show that it possesses the elementary qualities he assigns to it. The cogency of the evidence for any suggested constitution of atoms must vary with the number of facts which the hypothesis that they possess that constitution explains. Let us take, then, two steps in their proper order and inquire, first, whether there is valid ground for believing that all matter is made up of discrete parts; and secondly, whether we can have any knowledge of the constitution or properties which those parts possess.

THE COARSE-GRAINEDNESS OF MATTER.

Matter in bulk appears to be continuous. Such substances as water or air appear to the ordinary observer to be perfectly uniform in all their properties and qualities, in all their parts. The hasty conclusion that these bodies are really uniform is, nevertheless, unthinkable. In the first place, the phenomena of diffusion afford conclusive proof that matter when apparently quiescent is, in fact, in a state of internal commotion. I need not recapitulate the familiar evidence to prove that gases and many liquids when placed in communication interpenetrate or diffuse into each other; or that air in contact with a surface of water gradually becomes laden with water vapour, whilst the atmospheric gases in turn mingle with the water. Such phenomena are not exhibited by liquids and gases alone nor by solids at high temperatures only. Sir W. Roberts Austen has placed pieces of gold and lead in contact at a temperature of 18° C. After four years the gold had travelled into the lead to such an extent that not only were the two metals united, but on analysis appreciable quantities of the gold were detected even at a distance of more than five millimetres from the common surface, while within a distance of three-quarters of a millimetre from the surface gold had penetrated into the lead to the extent of one ounce six pennyweights per ton, an amount which could have been profitably extracted. Whether it is or is not possible to devise any other intelligible account of the cause of such phenomena, it is certain that a simple and adequate explanation is found in the hypothesis that matter consists of discrete parts in a state of motion, which can penetrate into the spaces between the corresponding parts of surrounding bodies.

The hypothesis thus framed is also the only one which affords a rational explanation of other simple and well-known facts. If matter is regarded as a continuous medium the phenomena of expansion are unintelligible. If, however, matter consists of discrete particles, separated from each other either by empty space or by something different from themselves, we can at once understand that expansion and contraction may be nothing more than the mutual separation or approach of these particles. Again, no clear mental picture can be formed of the phenomena of heat unless we suppose that heat is a mode of motion. And if heat be motion there can be no doubt that it is the fundamental particles of matter which are moving. For the motion is not visible, is not motion of the body as a whole, while diffusion, which is a movement of matter, goes on more quickly as the temperature rises, thereby proving that the internal motions have become more rapid, which is exactly the result which would follow if these were the movements which constitute sensible heat. Combining, then, the phenomena of diffusion, expansion, and heat, it is not too much to say that no hypotheses which make them intelligible have ever been framed other than those which are at the basis of the atomic theory. Many other considerations also point to the same conclusion. Many years ago Lord Kelvin gave independent arguments, based on the properties of gases, on the constitution of the surfaces of liquids, and on the electric properties of metals, all of which indicate that matter is, to use his own phrase, coarse-grained—that it is not identical in constitution throughout, but that adjacent minute parts are distinguishable from each other by being either of different natures or in different states. As a matter of history the two theories, which are not by any means mutually exclusive, that atoms are particles which can be treated as distinct in kind from the medium which surrounds them, and that they are parts of that medium existing in a special state, have both played a large part in the theoretical development of the atomic hypothesis. The atoms of Waterston, Clausius, and Maxwell were particles. The vortex-atoms of Lord Kelvin and the strain-atoms (if I may call them so) suggested by Mr. Larmor are states of a primary medium which constitutes a physical connexion between them, and through which their mutual actions arise and are transmitted.

[Professor Rücker here engaged in a discussion on the properties of the basis of matter. He continued:]

THE RANGE OF THE ATOMIC THEORY.

It would be most unfair, however, to the atomic theory to represent it as depending on one line of reasoning only or to treat its evidence as bounded by the very general propositions I have discussed. It is true that as the range of the theory is extended the fundamental conception that matter is granular must be expanded and filled in by supplementary hypotheses as to the constitution of the granules. It may also be admitted that no complete or wholly satisfactory description of that constitution can as yet be given; that perfection has not yet been attained here or in any other branch of science; but the number of facts which can be accounted for by the theory is very large compared with the number of additional hypotheses which are introduced; and the cumulative weight of the additional evidence obtained by the study of details is such as to add greatly to the strength of the conviction that in its leading outlines the theory is true. It was originally suggested by the facts of chemistry, and though, as we have seen, a school of chemists now thrusts it into the background, it is none the less true, in the words of Dr. T. E. Thorpe, that "every great advance in chemical knowledge during the last 90 years finds its interpretation in [Dalton's] theory."[1] The principal mechanical and thermal properties of gases have

[1] Thorpe, Essays on Historical Chemistry, 1894, p. 368.

been explained, and in large part discovered, by the aid of the atomic theory; and though there are outstanding difficulties they are, for the most part, related to the nature of the atoms and molecules and do not affect the question as to whether they exist. The fact that different kinds of light all travel at the same speed in interplanetary space while they move at different rates in matter is explained if matter is coarse-grained. But to attempt to sum up all this evidence would be to recite a text-book on physics. It must suffice to say that it is enormous in extent and varied in character and that the atomic theory imparts a unity to all the physical sciences which has been attained in no other way.

I must, however, give a couple of instances of the wonderful success which has been achieved in the explanation of physical phenomena by the theory we are considering, and I select them because they are in harmony with the line of argument I have been pursuing. When a piece of iron is magnetised its behaviour is different according as the magnetic force applied to it is weak, moderate, or strong. When a certain limit is passed the iron behaves as a non-magnetic substance to all further additions of magnetic force. With strong forces it does and with very weak forces it does not remain magnetised when the force ceases to act. Professor Ewing has imitated all the minute details of these complicated properties by an arrangement of small isolated compass needles to represent the molecules. It may fairly be said that as far as this particular set of phenomena is concerned a most instructive working model based on the molecular theory has not only been imagined but constructed. The next illustration is no less striking. We may liken a crowd of molecules to a fog; but while the fog is admitted by everybody to be made up of separate globules of water the critics of scientific method are sometimes apt to regard the molecules as mere fictions of the imagination. If, however, we could throw the molecules of a highly rarefied gas into such a state that vapour condensed on them, so that each became the centre of a water-drop till the host of invisible molecules was, as it were, magnified by accretion into a visible mist, surely no stronger proof of their reality could be desired. Yet there is every reason to believe that something very like this has been accomplished by Mr. C. T. R. Wilson and Professor J. J. Thomson.

It is known that it is comparatively difficult to produce a fog in damp air if the mixture consists of air and water-vapour alone. The presence of particles of very fine dust facilitates the process. It is evident that the vapour condenses on the dust particles and that a nucleus of some kind is necessary on which each drop may form. But electrified particles also act as nuclei, for if a highly charged body from which electricity is escaping be placed near a steam jet the steam condenses and a cloud is also formed in dust-free air more easily than would otherwise be the case if electricity is discharged into it. Again, according to accepted theory, when a current of electricity flows through a gas some of the atoms are divided into parts which carry positive and negative charges as they move in opposite directions, and unless this breaking-up occurs a gas does not conduct electricity. But a gas can be made a conductor merely by allowing the Roentgen rays or the radiation given off by uranium to fall upon it. A careful study of the facts shows that it is probable that some of the atoms have been broken up by the radiation and that their oppositely electrified parts are scattered among their unaltered fellows. Such a gas is said to be ionised. Thus by these two distinct lines of argument we come to the conclusions: (1) that the presence of electrified particles promotes the formation of mist and (2) that in an ionised gas such electrified particles are provided by the breaking-up of atoms. The two conclusions will mutually support each other if it can be shown that a mist is easily formed in ionised air. This was tested by Mr. Wilson who showed that in such air mist is formed as though nuclei were present, and thus in the cloud we have visible evidence of the presence of the divided atoms. If, then, we cannot handle the individual molecules we have at least some reason to believe that a method is known of seizing individuals, or parts of individuals, which are in a special state, and of wrapping other matter round them till each one is the centre of a discrete particle of a visible fog.

I have purposely chosen this illustration because the explanation is based on a theory—that of ionisation—which is at present subjected to hostile criticism. It assumes that an electrical current is nothing more than the movement of charges of electricity. But magnets placed near to an electric current tend to set themselves at right angles to its direction—a fact on which the construction of telegraphic instruments is based. Hence if the theory be true a similar effect ought to be produced by a moving charge of electricity. This experiment was tried many years ago in the laboratory of Helmholtz by Rowland who caused a charged disc to spin rapidly near a magnet. The result was in accord with the theory; the magnet moved as though acted upon by an electric current. Of late, however, M. Crémieu has investigated the matter afresh and has obtained results which, according to his interpretation, were inconsistent with that of Rowland. M. Crémieu's results are already the subject of controversy[2] and are, I believe, likely to be discussed in the Section of Physics. This is not the occasion to enter upon a critical discussion of the question at issue and I refer to it only to point out that though if M. Crémieu's result were upheld our views as to electricity would have to be modified the foundations of the atomic theory would not be shaken. It is, however, from the theory of ions that the most far-reaching speculations of science have recently received unexpected support. The dream that matter of all kinds will some day be proved to be fundamentally the same has survived many shocks. The opinion is consistent with the great generalisation that the properties of elements are a periodic function of their atomic weights. Sir Norman Lockyer has long been a prominent exponent of the view that the spectra of the stars indicate the reduction of our so-called elements to simpler forms, and now Professor J. J. Thomson believes that we can break off from an atom a part, the mass of which is not more than one-thousandth of the whole, and that these corpuscles, as he has named them, are the carriers of the negative charge in an electric current. If atoms are thus complex, not only is the *a priori* probability increased that the different structures which we call elements may all be built of similar bricks, but the discovery by Lenard that the ease with which the corpuscles penetrate different bodies depends only on the density of the obstacles and not on their chemical constitution is held by Professor Thomson to be "a strong confirmation of the view that the atoms of the elementary substances are made up of simpler parts, all of which are alike."[3] On the present occasion, however, we are occupied rather with the foundations than with these ultimate ramifications of the atomic theory; and having shown how wide its range is, I must to a certain extent, retrace my steps and return to the main line of my argument.

THE PROPERTIES OF ATOMS AND MOLECULES.

For if it be granted that the evidence that matter is coarse-grained and is formed of separate atoms and molecules is too strong to be resisted, it may still be contended that we can know little or nothing of the sizes and properties of the molecules. It must be admitted that though the fundamental postulates are always the same, different aspects of the theory, which have not in all cases been successfully combined, have to be developed when it is applied to different problems; but in spite of this there is little doubt that we have some fairly accurate knowledge of molecular motions and magnitudes. If a liquid is stretched into a very thin film, such as a soap-bubble, we should expect indications of a change in its properties when the thickness of the film is not a very large multiple of the average distance between two neighbouring molecules. In 1890 Sohncke[4] detected evidence of such a change in films of the average thickness of 106 millionths of a millimetre ($\mu\mu$), and quite recently Rudolph Weber found it in an oil-film when the thickness was 115 $\mu\mu$.[5] Taking the mean of these numbers and combining the results of different variants of the theory we may conclude that a film should become unstable and tend to rupture spontaneously somewhere between the thicknesses of 110 and 55 $\mu\mu$, and Professor Reinold and I found by experiment that this instability is actually exhibited between the thicknesses of 96 and 45 $\mu\mu$.[6] There can therefore be little doubt that the first approach to molecular magnitudes is signalled

[2] See Phil. Mag., July, 1901, p. 144, and Johns Hopkins University Circulars, xx., No. 152, May–June, 1901, p. 78.

[3] For the most recent account of the subject see an article on Bodies Smaller than Atoms, by Professor J. J. Thomson, in the Popular Science Monthly (The Science Press), August, 1901.

[4] Wied. Ann., 1890, xl., pp. 345–355.

[5] Annalen der Physik, 1901, iv., pp. 706–721.

[6] Philosophical Transactions, 1893, 184, pp. 505–529

when the thickness of a film is somewhat less than 100 $\mu\mu$, or four millionths of an inch.

Thirteen years ago I had the honour of laying before the Chemical Society a *résumé* of what was then known on these subjects,[7] and I must refer to that lecture or to the most recent edition of O. E. Meyer's work on the kinetic theory of gases[8] for the evidence that various independent lines of argument enable us to estimate quantities very much less than four millionths of an inch, which is perhaps from 500 to 1000 times greater than the magnitude which, in the present state of our knowledge, we can best describe as the diameter of a molecule. Confining our attention, however, to the larger quantities, I will give one example to show how strong is the cumulative force of the evidence as to our knowledge of the magnitudes of molecular quantities. We have every reason to believe that though the molecules in a gas frequently collide with each other, yet in the case of the more perfect gases the time occupied in collisions is small compared with that in which each molecule travels undisturbed by its fellows. The average distance travelled between two successive encounters is called the mean free path, and, for the reason just given, the question of the magnitude of this distance can be attacked without any precise knowledge of what a molecule is or of what happens during an encounter. Thus the mean free path can be determined, by the aid of the theory, either from the viscosity of the gas or from the thermal conductivity. Using figures given in the latest work on the subject,[9] and dealing with one gas only, as a fair sample of the rest, the lengths of the mean free path of hydrogen as determined by these two independent methods differ only by about 3 per cent. Further, the mean of the values which I gave in the lecture already referred to differed only by about 6 per cent. from the best modern result, so that no great change has been introduced during the last 13 years. It may, however, be argued that these concordant values are all obtained by means of the same theory and that a common error may affect them all. In particular, some critics have of late been inclined to discredit the atomic theory by pointing out that the strong statements which have sometimes been made as to the equality among themselves of atoms or molecules of the same kind may not be justified, as the equality may be that of averages only and be consistent with a considerable variation in the sizes of individuals. Allowing this argument more weight than it perhaps deserves, it is easy to show that it cannot affect seriously our knowledge of the length of the mean free path. Professor George Darwin[10] has handled the problem of a mixture of unequal spherical bodies in the particular case in which the sizes are distributed according to the law of errors, which would involve far greater inequalities than can occur among atoms. Without discussing the precise details of his problem it is sufficient to say that in the case considered by him the length of the mean free path is $\frac{1}{11}$ of what it would be if the particles were equal. Hence, were the inequalities of atoms as great as in this extreme case, the reduction of the mean free path in hydrogen could only be from 185 to 119 $\mu\mu$, but they must be far less, and therefore the error, if any, due to this cause could not approach this amount. It is probably inappreciable. Such examples might be multiplied, but the one I have selected is perhaps sufficient to illustrate my point—viz., that considerable and fairly accurate knowledge can be obtained as to molecular quantities by the aid of theories the details of which are provisional and are admittedly capable of improvement. The atomic theory must hold the field until another can be found which is not inferior as an explanation of the fundamental difficulties as to the constitution of matter and is, at the same time, not less comprehensive.

THE PHENOMENA OF LIFE.

But it may be asked—nay, it has been asked—may not the type of our theories be radically changed? If this question does not merely imply a certain distrust in our own powers of reasoning it should be supported by some indication of the kind of change which is conceivable. Perhaps the chief objection which can be brought against physical theories is that they deal only with the inanimate side of nature and largely ignore the phenomena of life. It is, therefore, in this direction, if in any, that a change of type may be expected. I do not propose to enter at length upon so difficult a question, but however we may explain or explain away the characteristics of life the argument for the truth of the atomic theory would only be affected if it could be shown that living matter does not possess the thermal and mechanical properties to explain which the atomic theory has been framed. This is so notoriously not the case that there is the gravest doubt whether life can in any way interfere with the action within the organism of the laws of matter in bulk belonging to the domain of mechanics, physics, and chemistry. Probably the most cautious opinion that could now be expressed on this question is that, in spite of some outstanding difficulties which have recently given rise to what is called Neovitalism, there is no conclusive evidence that living matter can suspend or modify any of the natural laws which would affect it if it were to cease to live. It is possible that though subject to these laws the organism while living may be able to employ, or even to direct, their action within itself for its own benefit, just as it unquestionably does make use of the processes of external nature for its own purposes; but if this be so the seat of the controlling influence is so withdrawn from view that on the one hand its very existence may be denied, while, on the other hand, Professor Haeckel, following Vogt, has recently asserted that "matter and ether are not dead and only moved by extrinsic force; but they are endowed with sensation and will; they experience an inclination for condensation, a dislike for strain; they strive after the one and struggle against the other."[11] But neither unproved assertions of this kind nor the more refined attempts that have been made by others to bring the phenomena of life and of dead matter under a common formula touch the evidence for the atomic theory. The question as to whether matter consists of elements capable of independent motion is prior to, and independent of, the further questions as to what these elements are, and whether they are alive or dead.

The physicist, if he keeps to his business, asserts, as the bases of the atomic theory, nothing more than that he who declines to admit that matter consists of separate moving parts must regard many of the simplest phenomena as irreconcileable and unintelligible, in spite of the fact that means of reconciling them are known to everybody, in spite of the fact that the reconciling theory gives a general correlation of an enormous number of phenomena in every branch of science, and that the outstanding difficulties are connected, not so much with the fundamental hypotheses that matter is composed of distinguishable entities which are capable of separate motions as with the much more difficult problem of what these entities are. On these grounds the physicist may believe that, though he cannot handle or see them, the atoms and molecules are as real as the ice crystals in a cirrus cloud which he cannot reach.

Physiology has specially flourished since physiologists have believed that it is possible to master the physics and chemistry of the framework of living things, and since they have abandoned the attitude of those who placed in the foreground the doctrine of the vital force. To supporters of that doctrine the principle of life was not a hidden directing power which could perhaps whisper an order that the floodgates of reservoirs of energy should now be opened and now closed, and could, at the most, work only under immutable conditions to which the living and the dead must alike submit. On the contrary, their vital force pervaded the organism in all its parts. It was an active and energetic opponent of the laws of physics and chemistry. It maintained its own existence not by obeying but by defying them; and though destined to be finally overcome in the separate campaigns of which each individual living creature is the scene, yet, like some guerilla chieftain, it was defeated here only to reappear there with unabated confidence and apparently undiminished force. This attitude of mind checked the advance of knowledge. Difficulty could be evaded by a verbal formula of explanation which in fact explained nothing. If the mechanical or physical or chemical causes of a phenomenon did not lie obviously upon the surface the investigator was tempted to forego the toil of searching for them below; it was easier to say that the vital force was the cause of the discrepancy, and that it was hopeless to attempt to account for the action of a principle which was incomprehensible in its nature.

THE LIMITS OF PHYSICAL THEORIES.

And this brings me to my last point. It is a mistake to

[7] Transactions of the Chemical Society, liii., March, 1888, pp. 222-262.
[8] Kinetic Theory of Gases: O. E. Meyer, 1899, translated by R. E. Baynes.
[9] Ibid.
[10] Philosophical Transactions, 180.
[11] Riddle of the Universe (English translation), 1900, p. 380.

treat physical theories in general, and the atomic theory in particular, as though they were parts of a scheme which has failed if it leaves anything unexplained, which must be carried on indefinitely on exactly the same principles, whether the ultimate results are, or are not, repugnant to common sense. Physical theories begin at the surface with phenomena which directly affect our senses. When they are used in the attempt to penetrate deeper into the secrets of nature it is more than probable that they will meet with insuperable barriers, but this fact does not demonstrate that the fundamental assumptions are false, and the question as to whether any particular obstacle will be for ever insuperable can rarely be answered with certainty. If no other conception of matter is possible than that it consists of distinct physical units—and no other conception has been formulated which does not blur what are otherwise clear and definite outlines—if it is certain, as it is, that vibrations travel through space which cannot be propagated by matter, the two foundations of physical theory are well and truly laid. It may be granted that we have not yet framed a consistent image either of the nature of the atoms or of the ether in which they exist; but I have tried to show that in spite of the tentative nature of some of our theories, in spite of many outstanding difficulties, the atomic theory unifies so many facts, simplifies so much that is complicated, that we have a right to insist—at all events, till an equally intelligible rival hypothesis is produced—that the main structure of our theory is true: that atoms are not merely helps to puzzled mathematicians but physical realities.

ON THE CHANGES EFFECTED BY ANTI-TYPHOID INOCULATION IN THE BACTERICIDAL POWER OF THE BLOOD; WITH REMARKS ON THE PROBABLE SIGNIFICANCE OF THESE CHANGES.

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INTRODUCTORY.

IN the last two of a series of preliminary papers published in THE LANCET[1] dealing with the quantitative estimation of the bactericidal power of the blood I described procedures (*a*) for obtaining without difficulty any desired dilutions of a bacterial culture; (*b*) for mixing together in a series of capillary tubes a series of small volumes of serum with corresponding volumes of each successive dilution of the bacterial culture; and (*c*) for testing the bactericidal effect produced by the serum upon these dilutions. In the papers in question I further pointed out that while the results of the estimations could be registered by indicating what was the lowest dilution of the culture sterilised by the addition of serum, a more satisfactory expression for the bactericidal power could be obtained by specifying the number of living bacteria contained in the dilution in question. In connexion with the last suggestion a simple procedure for enumerating the living bacteria contained in a culture was described.

The methods just outlined are the methods which have been employed in the experimental investigation whose results are to be detailed in this communication. Before passing to deal with these results it will be necessary briefly to advert to certain special difficulties and complications which are incident to an investigation like the present where the rise and fall of the bactericidal power is followed from day to day.

SPECIAL COMPLICATIONS INCIDENT TO THE INVESTIGATION.

Variations in the cultures and inadequacy of methods available for standardising these.—The first of the difficulties and complications just referred to relates to the standardisation of the bacterial cultures employed. It is manifestly a precondition of any determination of the curve which represents the effect of inoculation upon the bactericidal power of the blood that the cultures employed shall be comparable—comparable, that is to say, either in the sense of their requiring for their sterilisation equal quantities of bactericidal substance or in the sense of their eventual differences in this respect being accurately determinable. No completely adequate method of standardisation such as is here contemplated has as yet been worked out. Failing such a method the following steps were taken to achieve as far as possible the desired result. The broth cultures of the typhoid bacillus which were employed were in each case derived from one and the same stock. They had in each case been incubated for approximately the same time (from 18 to 24 hours). Except in the case of a few of the earlier estimations where this point was not specially attended to the broth tubes, which contained in each case 10 cubic centimetres of broth, had been inoculated with exactly the same quantity (five cubic millimetres) of the broth culture of the previous day. Again, except in the case of some of the earlier estimations, the number of living bacteria contained in the culture was determined by placing a series of measured volumes of both a 10,000,000 and a 100,000,000 dilution of the culture upon agar in such a manner as to obtain a growth in the form of isolated colonies.

This enumeration procedure, even supposing the operations to have been carried out in all cases with absolute accuracy, cannot, be it noted, be regarded as having constituted an adequate method of standardisation. 1. In the first place it can hardly be supposed that the nutrient medium to which the living typhoid bacilli were transferred can in each case have afforded conditions so favourable as to allow of each bacillus growing out into a colony.[2] 2. Again, in view of the high atmospheric temperature which prevailed during a part of the period of observation, and the interval which necessarily intervened between the enumerations that initiated the observations and the completion of the series of blood examinations, it is conceivable that a sensible multiplication of the typhoid bacilli may, in certain instances, have occurred in the watch-glasses containing the dilutions of the culture. 3. Lastly, it must be borne in mind that even young bacterial cultures may contain, and probably do in every case contain, in addition to living bacteria, a sensible and variable proportion of dead bacteria. The presence of such dead bacteria, though obviously it would not be disclosed by the enumeration procedure, would, as was insisted upon and exemplified in my last communication,[3] operate in the direction of diminishing the bactericidal effect exerted by a serum.

One or other of these sources of error that are incident to the procedure of enumeration appears to be responsible for the fact that the bactericidal estimations of June 24th would, if calculated out on the basis of the number of bacteria found in the enumeration, work out in the case of each of the eight bloods which were examined on that day as much below the standard of all previous experience, and this in spite of the fact that there was in the case of several of the bloods examined reason for expecting quite a different result. In view of this circumstance I have assumed that the enumeration procedure was on this occasion at fault and have in the tabular statement of results given below refrained from expressing these particular results in terms of the number of bacteria found in the enumeration procedure.[4]

Variations of the bactericidal power of the blood occurring independently of inoculation.—A second and very serious

[1] THE LANCET, Dec. 1st, 1900 (p. 1566), March 2nd (p. 609), and June 1st (p. 1532), 1901.

[2] The difficulties of preventing the collection of condensation water come particularly into consideration in appreciating the improbability of the conditions having everywhere been favourable to the development of all the bacilli implanted. It is true that whenever fresh agar was employed precautions in the form of flushing the surface with sterilised broth and the subsequent removal of all visible moisture were taken, but it is none the less possible that in certain of the estimations condensation water may have come in contact with, and may have exerted a bactericidal effect upon, some of the bacteria.

[3] THE LANCET, June 1st, 1901, p. 1534.

[4] As further justification of this action and as illustrating the degree of variation found by me in cultures employed I subjoin a record of the enumerations for the month of June. The figures given refer to the number of millions of typhoid bacilli calculated to be present in one cubic centimetre of the broth culture. They must be read in light of the fact that even a small extension of the period of cultivation is capable of making a great difference in the number of typhoid bacteria found, each bacillus when placed under favourable circumstances being capable of giving origin to two within a period of less than half an hour. June 2nd, 4200; 3rd, 1000; 4th, 10,000; 5th, 17,600; 6th, 27,600; 7th, 23,600; 10th, 300; 11th, 48,000; 12th, 14,800; 13th, 31,000; 14th, 14,400; 15th, 32,000; 18th, 25,200; 17th, 33,200; 18th, 18,000; 19th, 62,600; 20th, 1600; 21st, 31,000, 22nd, 6600; 25th, 400; 26th, 8000; 26th, 2400; and 27th, 9600.

complication of an investigation like the present is to be found in the circumstance that the variations of bactericidal power of the blood which occur in the course of ordinary healthy life have not as yet been studied. In particular no attention has as yet been given to the determination of the effect exerted on the bactericidal power by such incidents as the ingestion of food and abstinence from such, the exhibition or withdrawal of alcohol, exposure to chills, and physical and mental fatigue. The influence of the factor last mentioned comes into consideration in connexion with the present investigations, the association of conditions of fatigue with a low bactericidal power having repeatedly thrust itself upon the attention both in connexion with the estimations of my own bactericidal power, and in connexion with such estimations made upon inoculated and uninoculated Surgeons-on-probation both before and during the course of the competitive examinations at the Army Medical School, Netley, which decide the award of commissions and the position of the candidates on the list of seniority. The low bactericidal effects registered on June 24th, 25th, and 26th in the case of the Surgeons-on-probation indicated in the table by the serial numbers 3, 8, 9, 10, 13, and 16, and on June 6th and 10 in the case of the Surgeon-on-probation indicated by the serial number 4, appear to me to stand in relation with a condition of fatigue which was in some of these cases obvious enough to arrest immediate attention.

In spite of the disturbing factors adverted to the effect produced by an anti-typhoid inoculation can be unmasked.—Although the disturbing influences spoken of above may upon occasion falsify the estimate formed of the "strength" of a culture, and also upon occasion increase or decrease the bactericidal power of an individual (or group of individuals living under similar external conditions) subjected to experiment, it is none the less possible, especially when operating successively on a series of patients, as was done in the present investigation, to determine what alterations in the blood are produced by an incident such as an anti-typhoid inoculation, and to lay down with a considerable degree of precision the broad lines of the curve which represents the changes in the bactericidal power of the blood produced by such an incident.

Before proceeding to consider the nature of these changes it will be convenient to give a general outline of the investigations undertaken.

GENERAL OUTLINE OF THE INVESTIGATIONS UNDERTAKEN.

Persons experimented upon and period during which these were observed.—The observations were in each case made upon Surgeons-on-probation in attendance on the Army Medical School, Netley, the period of observation being brought to a close at the end of the session. In accordance with the fact that the first inoculation was performed at the end of March, and that the session came to a close at the end of June the maximum time for which the inoculated remained under observation was a period of three months. In the large majority of cases the period of observation after inoculation was much shorter than this.

In each case a sample of blood was drawn off before inoculation. The estimation of these samples of blood was—and this applies equally to the samples of blood drawn off subsequent to inoculation—in every instance carried out within from two to three hours after the blood had been taken from the finger.

Particulars with regard to vaccine and dose employed.—With a view to breaking in as little as possible upon recreations and study the first inoculations were in almost every case undertaken with very small doses of vaccine. The doses administered in these first inoculations represented only from one-third to one-half of the dose prescribed in the case of soldiers undergoing only a single inoculation. The vaccine employed in the case of the Surgeons-on-probation designated in the tabular statement given below by the serial numbers from 1 to 16 inclusive was freshly prepared vaccine derived from two successive "brews" designated respectively by the serial numbers 32 and 33. As shown in a previous paper[5] Vaccine 32 was the "stronger" of the two vaccines, five volumes of the vaccine being, as judged by the anti-bactericidal effect exerted on blood *in vitro*, the equivalent of six volumes of Vaccine 33. The vaccine employed in the case of the Surgeons-on-probation designated by the serial numbers from 17 to 20 inclusive was vaccine which had been prepared as far back as 1899, and which had, after issue to South Africa, been returned to stock unopened and in a sterile condition.

Clinical symptoms.—In conformity with the fact that the primary inoculations were in almost every case undertaken with greatly reduced doses of vaccine the local and constitutional disturbances generally seen after anti-typhoid inoculation were conspicuously absent. In most cases the symptoms were limited to a little tenderness at the site of inoculation and a slight and transient feeling of malaise which did not involve any absenteeism from meals. The influence of personal idiosyncrasy, however, manifested itself; the patient indicated by the serial number 5 not finding any cause for complaint after an inoculation with 1·25 cubic centimetres of Vaccine 33, and the patient indicated by the serial number 17 declaring the prick of the inoculating needle to be the only painful event in the procedure; while the patients indicated by the serial numbers 3 and 13 are reported to have suffered somewhat severely—as, indeed, was testified to by the circumstance that they were noticeably pale and in less vigorous health for a not inconsiderable period after undergoing the inoculation.

Passing now to set forth the observations made on the bactericidal power of the blood anterior to and subsequent to anti-typhoid inoculation, I may explain that the observations in the table subjoined are classified into (*a*) a group of observations relating to 14 Surgeons-on-probation, who, not having previously suffered from typhoid fever, were inoculated with fresh typhoid vaccine; (*b*) a group of observations relating to two Surgeons-on-probation who, having recently convalesced from attacks of typhoid fever, were inoculated with fresh typhoid vaccine; and (*c*) a group of four Surgeons-on-probation who, not having previously suffered from typhoid fever, were inoculated with typhoid vaccine prepared respectively 18 and 24 months anterior to the date of its employment.

ANALYSIS OF THE DATA SET FORTH IN THE TABLE.

Occurrence of a positive phase of increased bactericidal power.—The most striking fact which is brought out by consideration of the results tabulated above is the fact that in the case of 13 out of 14 normal persons inoculated with freshly-prepared vaccine, further, in one out of two convalescents from typhoid fever inoculated, and again in two out of four normal persons inoculated with vaccine prepared from 18 to 24 months previously, definite evidence was obtained of an increased bactericidal effect exerted upon the typhoid bacillus[6] by the blood drawn off subsequent to anti-typhoid inoculation. In three of the four cases where a positive phase failed to come under observation the non-appearance of a positive phase may have been due to the premature interruption of the observations by the dispersal of the students.

The degree to which the bactericidal power may be increased is brought out most distinctly in the case of the patients inoculated subsequently to the middle of May, after which date the typhoid bacilli in the cultures employed were in each case enumerated. The most striking examples of an increase in bactericidal power consequent upon inoculation are the following: a minimum increase of 40-fold in the bactericidal power was registered in the case of Patient 6 on the seventh day after inoculation; a minimum increase of over 100-fold was registered in Patients 7, 8, and 10 respectively on the first, twentieth, and fifteenth days after inoculation. Again, in Patient 16 a minimum increase of over 400-fold was registered on the sixth day after inoculation.

Occurrence of a negative phase of diminished bactericidal power.—The point that next attracts attention on consideration of the observations recorded above is the fact that in certain instances a negative phase of diminished bactericidal power came under observation in the period subsequent to inoculation. A well-marked example of such a negative phase is afforded by the series of observations made on Patient 3, this patient being one of those referred to above as having suffered more severely than his fellows. It will be seen on reference to the table that the bactericidal power of the patient's blood declined from a comparatively high average before inoculation to a point below which it could not be quantitatively estimated by the

[5] THE LANCET, June 1st, 1901, p. 1534.

[6] It may be noted in passing that in some comparative estimations—made before and after anti-typhoid inoculations—of the bactericidal effect exerted upon the cholera bacillus this effect was not found to vary. The question is, however, one which requires detailed investigation.

method employed (unless by employing much larger quantities of blood). The negative phase of diminished bactericidal power continued in this case for at least three weeks after the date of inoculation. Before the fifth week a very marked positive phase of increased bactericidal power had, however, established itself, and in the eighth week it was found that one cubic centimetre of the patient's blood had acquired the power of devitalising more than 3,000,000,000 of typhoid bacilli, this being one of the best results obtained in the present observations. Further evidence of the occurrence of a negative phase of diminished bactericidal power subsequent to inoculation is afforded in the case of Patient 8; in the case of Patient 9 (after both first or second inoculations); in the case of Patient 13 (who, like Patient 3, had presented a clinical reaction of more than the average severity); and again in the case of Patients 14, 16, and 20. Among these the case of Patient 8 is particularly interesting as showing that a transient initial rise of the bactericidal power may (presumably in circumstances where the inoculated material is only slowly absorbed into the blood) precede the negative phase. Similar indications can be gathered from a consideration of some of the other cases. Lastly, in connexion with the occurrence and significance of a negative phase after inoculation it may be noted that in an experiment carried out upon myself (already referred to in my last communication)[7] in which a somewhat larger dose of vaccine than usual (1·5 cubic centimetres of Vaccine 32) was injected, the pronounced negative phase which supervened was not followed by anything in the nature of a definite positive phase, though the blood after an interval of two months regained, but apparently only temporarily, the same high bactericidal power which it was found to possess in three successive observations made in the week previous to inoculation.

Conditions which determine occurrence and duration of the negative phase.—It would appear on consideration of all the circumstances that the occurrence or non-occurrence of a negative phase of diminished bactericidal power subsequent to inoculation, and the duration of this when it supervenes, is determined, on the one hand by the quantum of vaccine inoculated, and on the other hand by the greater or less resisting powers of the inoculated organism as judged of by the severity of the symptoms which supervene upon inoculation. While it does not appear from such data as are at present available that the severity of these symptoms stands in any relation to the bactericidal power of the blood antecedent to inoculation, it is beyond doubt that the increased bactericidal power which is obtained by inoculation is associated with a greater tolerance of the typhoid poisons. It will be seen on reference to the table that in spite of the larger doses of vaccine employed in the case of the second inoculations these last were not in any instance succeeded either by marked clinical symptoms or by a serious or long-lasting negative phase.

Time required for the development of a positive phase of increased bactericidal power and duration of this phase.—One of the most interesting facts with regard to the development of the positive phase is the extraordinarily short period which is required for its development in cases where a negative phase does not manifest itself after inoculation. Reference to the table will show that in the majority of cases the positive phase manifested itself in a distinct manner on the day succeeding the inoculation. It must remain for further research to determine within what period of hours it first begins to manifest itself.

The full development of the positive phase appears, on the contrary, to occupy in most cases a considerable number of days. In a minority of cases the bactericidal power may continue to increase for a considerable number of weeks after the date of inoculation. No definite decision as to average duration of the positive phase can be arrived at by a consideration of the data incorporated in the table. This is accounted for on the one hand by the circumstance that many of the inoculated were under observation only for a comparatively short period after inoculation, and, on the other hand, by the circumstance that the disturbing factors adverted to in the early part of this paper may have influenced the results in the later observations. From a consideration of the whole of the data it would, however, seem probable that the positive phase of increased bactericidal power lasts only for a comparatively short time. It is to be observed that the indications with regard to this question which can be gathered from the present investigations appear to be in harmony with a series of observations made by Major W. B. Leishman and myself, which showed that the average bactericidal power of the blood of a series of invalided soldiers who had been inoculated some 12 to 18 months previously was only very slightly higher than that of a similar series of invalided soldiers who had not been inoculated.

[7] THE LANCET, June 1st, 1901, p. 1534.

DISCUSSION OF THE SIGNIFICANCE OF THE CHANGES IN THE BACTERICIDAL POWER PRODUCED BY INOCULATION.

In the absence of assurance on the question as to whether the bactericidal substances do or do not circulate as such in the lymph and blood it is impossible to determine whether the alterations in the bactericidal power which supervene after anti-typhoid inoculation correspond to changes in the constitution of the blood such as would directly affect the vitality of typhoid bacilli introduced into the body, or to changes such as would contribute only in an indirect manner to the devitalisation of the typhoid bacilli *in vivo*. But even taking this latter view—taking, that is to say, the view that alterations in the bactericidal power of the blood correspond only to alterations effected in a stock of bactericidal substances which is only in an indirect manner available for use—there would still seem to be a very strong presumption that a negative phase, corresponding as it would to a phase when the reserves of bactericidal substance had been sensibly drawn upon, would import a diminished resistance to invasion, while a positive phase, corresponding as it would to a phase when larger reserves of bactericidal substances were available, would import an increased resistance to invasion.

Remembering that this is only an *a priori* conclusion, we shall do well to inquire whether any of the observations which have been made regarding the effects of anti-typhoid inoculation, or any of the facts which have been ascertained with regard to typhoid fever generally, give countenance to the interpretation of the negative and positive phases which seems imposed upon us by the *a priori* considerations adduced above.

Significance of the negative phase considered.—We may consider, first, whether any instances of increased susceptibility to typhoid infection, or of diminished power of resistance to the disease when already contracted, have come under observation in the period following upon inoculation. This question is far from easy to resolve, for where isolated cases of typhoid fever occur within a short period after inoculation, these may be accounted for by assuming that the infection had been contracted anterior to inoculation. Again, when such cases terminate fatally an explanation may be found for this in the assumption that the infection contracted before inoculation was a very virulent one. And such assumptions may quite well in many cases be in actual accordance with the facts. The important question, however, remains whether there is a residuum of cases to which these explanations do not properly apply.

A conclusive answer to this question could be obtained only by comparing the incidence and average severity of the cases occurring in the inoculated in the period immediately subsequent to inoculation with the incidence and severity of the cases occurring in the uninoculated during the same period. Opportunities for instituting on a sufficient scale the strict comparison that would be desirable in such a case have probably never presented themselves. Failing such we must make use of such material as exists, keeping, of course, carefully in view the possibility that erroneous conclusions may be drawn from a consideration of isolated examples.

After giving the matter careful consideration it seems to me that the following facts and opinions raise a fairly strong presumption that a diminution of the resisting power of the system to typhoid infection has in isolated instances come under observation in the period subsequent to inoculation. (*a*) In the case of the 3rd Hussars inoculated by me in Lucknow in February, 1899, during a severe epidemic of typhoid fever, five cases of typhoid fever, of which two were fatal, occurred among 303 inoculated soldiers within 19 days after inoculation, no case occurring during the same period in 281 uninoculated soldiers in the same regiment.[8] After allowing for the fact that in certain of the cases in question there was evidence that the patient had been ailing before the date

[8] It is to be noted that before the end of the year there was, even if it be assumed that in all of these five cases the disease was contracted subsequently to inoculation, a very marked balance of advantage in favour of the inoculated.

TABLE I.—OBSERVATIONS ON EFFECT OF INOCULATION OF NORMAL MEN WITH FRESHLY-PREPARED ANTI-TYPHOID VACCINE.—(*First Portion.*)

Serial number.	Particulars of the determinations of bactericidal power made anterior to inoculation.			Particulars with regard to the inoculations.			Particulars of the determinations of bactericidal power made subsequent to inoculation.					
	Date.	A. See footnote.	B. See footnote.	Date.	C. See footnote.	D. See footnote.	Date.	A. See footnote.	B. See footnote.	Date.	A. See footnote.	B. See footnote.
1	1901 April 28th.	1 in 1000.	1 in 10,000.	1901 April 29th.	33	0.5 c.c.	1901 April 30th.	1 in 10.	1 in 50.	1901 May 7th.	—	1 in 10.
2	May 6th. —	1 in 100. —	1 in 500. —	May 6th. May 26th.	33 33	0·5 c.c. 1 c.c.	May 7th. May 27th.	1 in 10, 60 millions. 1 in 5, 800 millions.	1 in 50, 12 millions. 1 in 10, 400 millions.	May 22nd. June 4th.	1 in 10, 730 millions. 1 in 5, 2000 millions.	1 in 25, 292 millions. 1 in 10, 1000 millions.
3	April 1st. April 22nd.	1 in 10. 1 in 5.	1 in 100. 1 in 10.	April 22nd. —	33 —	0·5 c.c. —	April 30th. —	1 in 10,000. —	— —	May 13th. —	1 in 10,000. —	— —
4	March 30th. — —	1 in 10. — —	1 in 100. — —	March 30th. April 15th. —	32 32 —	0·3 c.c. 1 c.c. —	March 31st. April 16th. June 24th.	1 in 1. 1 in 1000. 1 in 10.	1 in 10. 1 in 10,000. 1 in 25.	April 15th. April 23rd. —	1 in 1000. 1 in 25. —	— 1 in 50. —
5	April 28th. —	1 in 10,000. —	— —	April 22th. May 19th	33 34	1·25 c.c. 1·5 c.c.	April 29th. May 20th.	1 in 1000. —	1 in 10,000. 1 in 10, 1500 millions.	May 6th. May 27th.	1 in 500. 1 in 2, 2000 millions.	1 in 1000. 1 in 5 800 millions.
6	June 10th.	1 in 100, 8 millions.	1 in 1000, 0·8 million.	June 10th.	32	0·3 c.c.	June 12th.	1 in 100, 148 millions.	1 in 1000, 14·8 millions.	June 17th.	1 in 50, 664 millions.	1 in 100, 332 millions.
7	June 10th.	1 in 100, 8 millions.	1 in 1000. 0·8 million.	June 10th.	32	0·5 c.c.	June 11th.	1 in 25, 1840 millions.	1 in 50, 920 millions.	June 19th.	1 in 50, 1252 millions.	1 in 100, 626 millions.
8	May 15th.	1 in 1000, 20 millions.	—	June 15th.	33	0·5 c.c.	May 16th.	1 in 5, 266 millions.	1 in 10, 133 millions.	May 17th.	1 in 100.	1 in 1000.
9	May 15th. —	1 in 50, 400 millions. —	1 in 100, 200 millions. —	May 15th. June 4th.	33 33	0·5 c.c. 1 c.c.	May 16th. June 5th.	1 in 5, 264 millions. 1 in 50, 352 millions.	1 in 10, 132 millions. 1 in 100, 176 millions,	May 17th. June 11th.	1 in 100. 1 in 25, 1840 millions.	1 in 1000. 1 in 50, 920 millions.
10	June 6th. —	1 in 1000, 27·6 millions. —	1 in 10,000, 2·76 millions. —	June 6th. June 25th.	32 32	0·5 c.c. 1 c.c.	June 7th. June 26th.	1 in 100, 236 millions. 1 in 2, 1200 millions.	1 in 1000, 23·6 millions. 1 in 5, 480 millions.	June 11th. June 27th.	1 in 25, 1840 millions. 1 in 50, 192 millions.	1 in 50, 920 millions. 1 in 100, 96 millions.
11	June 3rd.	—	1 in 5, 200 millions.	June 3rd.	33	0·5 c.c.	June 4th.	1 in 2, 5000 millions.	1 in 5, 2000 millions.	June 5th.	1 in 5, 3520 millions.	1 in 10, 1760 millions.
12	June 11th.	1 in 1000, 46 millions.	1 in 10,000, 4·6 millions.	June 11th.	32	0·5 c.c.	June 12th.	1 in 10, 1480 millions.	1 in 25, 592 millions.	June 17th.	1 in 10, 3320 millions.	1 in 25, 1328 millions.
13	May 15th	1 in 10, 2000 millions.	1 in 25, 800 millions.	May 15th.	33	0·5 c.c.	May 16th.	1 in 50, 366 millions.	1 in 100, 133 millions.	May 20th.	1 in 10, 750 millions.	1 in 25, 300 millions.
14	June 11th.	1 in 50, 920 millions.	1 in 100, 460 millions.	June 11th.	32	0·5 c.c.	June 12th.	1 in 100, 138 millions.	1 in 1000, 13·8 millions.	June 25th.	1 in 2, 2000 millions.	1 in 5, 800 millions.

A. Dilution of the culture and (where available) number of bacteria which 1 cubic centimetre of serum failed to kill.
B. Dilution of the culture and (where available) number of bacteria which 1 cubic centimetre of serum killed.
C. Serial number of the vaccine employed. D. Quantity administered.
* The presence of the asterisk denotes that there was an irregular result in one of the series of capillary tubes.

TABLE I.—OBSERVATIONS ON EFFECT OF INOCULATION OF NORMAL MEN WITH FRESHLY-PREPARED ANTI-TYPHOID VACCINE.—(*Second Portion.*)

Particulars of the determinations of bactericidal power made subsequent to inoculation.—(*Continued.*)

Serial number.	Date.	A. See footnote.	B. See footnote.	Date.	A. See footnote.*	B. See footnote.	Date.	A. See footnote.	B. See footnote.	Date.	A. See footnote.	B. See footnote.
1	1901. May 9th.	1 in 5, 400 millns.	1 in 10, 200 millns.	1901. June 4th.	1 in 5, 2000 millns.	1 in 10, 1000 millns.	1901. June 21st.	1 in 2, 15,500 millns.	1 in 5, 6200 millns.	1901. June 27.	1 in 2, 4800 millns.	1 in 5, 1920 millns.
2	May 28th.	1 in 25, 112 millns.	1 in 50, 56 millions.	—	—	—	—	—	—	—	—	—
	June 18th.	1 in 2, 9400 millns.	1 in 5, 3760 millns.	—	—	—	—	—	—	—	—	—
3	May 23rd.	—	1 in 5, 1480 millns.	June 3rd.	1 in 2, 500 millns.	1 in 5, 200 millns.	June 17th.	1 in 5, 1640 millns.	1 in 10, 3370 millns.	June 26th.	1 in 5, 480 millns.	1 in 10, 240 millns.
4	—	—	—	—	—	—	—	—	—	—	—	—
	May 7th.	1 in 50, 12 millions.	1 in 100, 6 millions.	May 23rd.	1 in 2, 3850 millns.	1 in 5, 1460 millns.	June 6th.	1 in 100, 276 millns.	1 in 1000, 27·6 millns.	June 10th.	1 in 100, 8 millions.	1 in 1000, 0·8 millions
5	May 8th.	1 in 10.	1 in 35,	May 19th.	1 in 100, 40 millions.	1 in 1000, 4 millions.	—	—	—	—	—	—
	June 3rd.	1 in 2, 500 millns.	1 in 5, 200 millns.	June 18th.	1 in 5. 3760 millns.	1 in 50, 376 millns.	June 27th.	1 in 25, 384 millns.	1 in 50, 192 millns.	—	—	—
6	June 24th.	1 in 50.	1 in 100.	June 25th.	1 in 10. 400 millns.	1 in 25, 160 millns.	—	—	—	—	—	—
7	June 21st.	1 in 25, 1240 millns.	1 in 50, 620 millns.	June 28th.	1 in 5. 480 millns.	1 in 10, 240 millns.	—	—	—	—	—	—
8	May 20th.	1 in 1000, 7·5 millions.	1 in 10,000, 0·75 millns.	June 4th.	1 in 2, 5000 millns.	1 in 5, 2000 millns.	June 14th.	1 in 25, 576 millns.	1 in 50, 288 millns.	June 25th.	1 in 1000, 4 millions.	0 in 10,000, 0·4 millions.
9	May 21st.	—	1 in 5, 1062 millns.	June 4th.	1 in 10, 1000 millns.	1 in 25, 400 millns.	—	—	—	—	—	—
	June 21st.	1 in 10, 3100 millns.	1 in 25, 1240 millns.	June 26th.	1 in 10, 240 millns.	1 in 25, 96 millions.	—	—	—	—	—	—
10	June 21st.	1 in 5, 6200 millns.	1 in 10, 3100 millns.	June 25th.	1 in 100, 40 millions.	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—
11	June 6th.	1 in 10, 2760 millns.	1 in 25, 1104 millns.	June 18th.	1 in 50, 376 millns.	1 in 100, 188 millns.	June 28th.	1 in 10, 240 millns.	1 in 25, 96 millions.	—	—	—
12	—	—	—	—	—	—	—	—	—	—	—	—
13	June 12th.	1 in 2, 7400 millns.	1 in 5, 2960 millns.	June 24th.	1 in 2.	1 in 25.	June 28th.	1 in 100, 40 millions.	—	—	—	—
14	—	—	—	—	—	—	—	—	—	—	—	—

A. Dilution of the culture and (where available) number of bacteria which 1 cubic centimetre of serum failed to kill.
B. Dilution of the culture and (where available) number of bacteria which 1 cubic centimetre of serum killed.
* The presence of the asterisk denotes that there was an irregular result in *one* of the series of capillary tubes.

TABLE II.—OBSERVATIONS ON EFFECT OF INOCULATION OF TYPHOID CONVALESCENTS WITH FRESHLY-PREPARED ANTI-TYPHOID VACCINE—*(First Portion)*.

Serial number.	Particulars of the determinations of bactericidal power made anterior to inoculation.			Particulars with regard to the inoculations.			Particulars of the determinations of bactericidal power made subsequent to inoculation.					
	Date.	A. See footnote.	B. See footnote.	Date.	C. See footnote.	D. See footnote.	Date.	A. See footnote.	B. See footnote.	Date.	A. See footnote.	B. See footnote.
	1901.			1901.			1901.			1901. *		
15	April 20th.	1 in 10.	1 in 25.	April 30th.	33	1 c.c.	May 1st.	1 in 10, 1100 millions.	1 in 25, 440 millions.	May 21st.	1 in 10, 525 millions.	1 in 25, 210 millions.
16	May 2nd.	1 in 1000, 7 millions.	1 in 10,000, 0·7 millions.	June 15th.	32	0·5 c.c.	June 16th.	1 in 100,000, 0·25 millions.	—	June 17th.	1 in 50, 664 millions.	1 in 100, 332 millions.
	June 10th.	1 in 100, 8 millions.	1 in 1000, 0·8 millions.	—	—	—	—	—	—	—	—	—
	June 15th.	1 in 10,000, 5·2 millions.	1 in 100,000, 0·3 millions.	—	—	—	—	—	—	—	—	—

TABLE III.—OBSERVATIONS ON EFFECT OF INOCULATION OF NORMAL MEN WITH ANTI-TYPHOID VACCINE PREPARED FROM 18 TO 24 MONTHS PREVIOUSLY—*(First Portion)*.

Serial number.	Particulars of the determinations of bactericidal power made anterior to inoculation.			Particulars with regard to the inoculations.			Particulars of the determinations of bactericidal power made subsequent to inoculation.					
	Date.	A. See footnote.	B. See footnote.	Date.	C. See footnote.	D. See footnote.	Date.	A. See footnote.	B. See footnote.	Date.	A. See footnote.	B. See footnote.
17	1901. June 11th.	1 in 25, 1840 millions.	1 in 50, 920 millions.	1901. June 11th.	3	0·4 c.c.	1901. June 12th.	1 in 5, 2960 millions.	1 in 10, 1480 millions.	June 17th.	1 in 50, 664 millions.	1 in 100, 332 millions.
	—	—	—	June 24th.	3	0·75 c.c.	June 25th.	1 in 10, 400 millions.	1 in 25, 160 millions.	—	—	—
18	June 16th.	1 in 50, 504 millions.	1 in 100, 252 millions.	June 16th.	3	0·3 c.c.	June 17th.	1 in 50, 664 millions.	1 in 100, 332 millions.	June 21st.	1 in 10, 3110 millions.	1 in 25, 1240 millions.
19	June 12th.	1 in 100, 148 millions.	1 in 1000, 14·8 millions.	June 12th.	3	0·75 c.c.	June 13th.	1 in 50, 620 millions.	1 in 100, 310 millions.	June 14th.	1 in 50, 288 millions.	1 in 100, 144 millions.
20	June 13th.	1 in 25, 1240 millions.	1 in 50, 620 millions.	June 13th.	6	0·5 c.c.	June 14th.	1 in 25, 576 millions.	1 in 50, 288 millions.	June 18th.	1 in 50, 376 millions.	1 in 100, 188 millions.

A. Dilution of the culture and (where available) number of bacteria which one cubic centimetre of serum failed to kill.
B. Dilution of the culture and (where available) number of bacteria which one cubic centimetre of serum killed.
C. Serial number of the vaccine employed. D. Quantity administered.
* The presence of the asterisk denotes that there was an irregular result in one of the series of capillary tubes.

of inoculation the disproportionate number of cases occurring in the inoculated seems to point to a phase of increased susceptibility following immediately upon inoculation. (*b*) Again, it is suggestive that the only case of typhoid fever which occurred in Egypt among the inoculated in 1900 was a case of a man admitted to hospital with typhoid fever 33 days after inoculation. This man succumbed to the disease. (*c*) Dr. F. D. Boyd,[9] speaking with an experience acquired while serving in South Africa on the staff of the Edinburgh Hospital, refers to isolated instances of persons who failed to make a satisfactory recovery after anti-typhoid inoculation and who afterwards fell victims to typhoid fever. Dr. Boyd is disposed to the opinion that in the instance or instances he has in view the resistance to typhoid fever was lowered by inoculation. (*d*) Mr. C. A. Leedham Green,[10] also, speaking of his experience of anti-typhoid inoculation in South Africa, while quite satisfied of the utility of the process, was able to adduce several instances of persons who, not having made a complete recovery from the effect of the anti-typhoid inoculations undertaken on the voyage to South Africa, contracted the disease in a fatal form very soon after landing. (*e*) Mr. Henry M. Cullinan, in a paper[11] in which he reports the favourable results obtained from a series of 511 anti-typhoid inoculations undertaken in connexion with a serious epidemic of typhoid in the Richmond Asylum, Dublin, gives some details of a severe case which developed 12 days after inoculation, and expressed an opinion that "the serum [meaning thereby the anti-typhoid vaccine] on this occasion acted detrimentally." (*f*) Dr. H. H. Tooth,[12] in recounting his experience of anti-typhoid inoculation gained while serving on the staff of the Portland Hospital in South Africa, took occasion to point out that in his judgment those in whom the constitutional disturbance after inoculation was most marked gave the least satisfactory results in the matter of subsequent resistance to the disease. The bearing of the observation on the question now at issue will be manifest when it is remembered that the negative phase of diminished bactericidal power appears to be most marked in those in whom the constitutional disturbance after inoculation has been most severe.

Significance of the positive phase considered.—Turning now to the question of the significance of the positive

[9] Report of Edinburgh and East of Scotland South African Hospital, 1901, p. 155.

[10] Privately communicated.

[11] Dublin Journal of Medical Science, July, 1901.

[12] Clinical Society, August 3rd, 1901.

TABLE II.—OBSERVATIONS ON EFFECT OF INOCULATION OF TYPHOID CONVALESCENTS WITH FRESHLY-PREPARED ANTI-TYPHOID VACCINE—(*Second Portion*).

Serial number.	Particulars of the determinations of bactericidal power made subsequent to inoculation—(*continued*).											
	Date.	A. See footnote.	B. See footnote.	Date.	A. See footnote.	B. See footnote.	Date.	A. See footnote.	B. See footnote.	Date.	A. See footnote.	B. See footnote.
15	1901. June 4th.	1 in 10, 1000 millns.	1 in 25, 400 millns.	June 24th.	1 in 10.	1 in 25.	June 25th.	1 in 5, 600 millns.	1 in 10, 400 millns.	—	—	—
16	June 21st.	1 in 10, 3100 millns.	1 in 25, 1240 millns.	June 24th.	1 in 2.	1 in 5.	June 25th.	1 in 2, 2000 millns.	1 in 25, 160 millns.	June 27th.	1 in 10, 980 millns.	1 in 25, 344 millns.
	—	—	—	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—

TABLE III.—OBSERVATIONS ON EFFECT OF INOCULATION OF NORMAL MEN WITH ANTI-TYPHOID VACCINE PREPARED FROM 18 TO 24 MONTHS PREVIOUSLY—(*Second Portion*).

Serial number.	Particulars of the determinations of bactericidal power made subsequent to inoculation—(*continued*).											
	Date.	A. See footnote.	B. See footnote.	Date.	A. See footnote.	B. See footnote.	Date.	A. See footnote.	B. See footnote.	Date.	A. See footnote.	B. See footnote.
17	1901. June 24th.	1 in 25.	1 in 50.	—	—	—	—	—	—	—	—	—
	—	—	—	—	—	—	—	—	—	—	—	—
18	June 24th.	1 in 50.	1 in 100.	—	—	—	—	—	—	—	—	—
19	June 21st.	1 in 25, 1240 millns.	1 in 50, 620 millns.	June 24th.	1 in 10.	1 in 25.	June 27th.	1 in 50, 192 millns.	1 in 100, 96 millions.	—	—	
20	June 22nd.	1 in 50, 132 millns.	1 in 100, 66 millions.	June 27th.	1 in 25, 384 millns.	1 in 50, 192 millns	—	—	—	—	—	—

A. Dilution of the culture and (where available) number of bacteria which one cubic centimetre of serum failed to kill.
B. Dilution of the culture and (where available) number of bacteria which one cubic centimetre of serum killed.
* The presence of the asterisk denotes that there was an irregular result in one of the series of capillary tubes.

phase of increased bactericidal power we must, as already stated above, assume on *a priori* reasons that the increase of the bactericidal power, which takes place either immediately after inoculation or after the intervention of a negative phase, corresponds to an increased resistance to typhoid infection. At the same time it is well to realise that in the absence of a series of systematic blood examinations made on inoculated persons who subsequently respectively contract or resist the infection of typhoid fever the question of the interdependence of immunity to the disease and a high bactericidal power cannot be finally settled. Two points, however, which have reference respectively to the dates on which the period of protection commences and expires may profitably be glanced at in this connexion.

With regard to the commencement of the period of protection it is to be noted that the general result obtained where the inoculations have been applied in the presence of a typhoid epidemic would seem to indicate that protection is very rapidly acquired. These clinical observations may be brought into relation with the fact that in the observations tabulated above a definite increase of bactericidal power was in most cases established within 24 hours.

With regard to the date at which the protective influence of inoculation ceases to make itself felt, it would seem probable from the fact that the records dealing with the effect of anti-typhoid inoculation afford no indications of an early falling off of the protective influence exerted, that this influence extends beyond the period covered by the positive phase. Assuming this to be the case (and it need hardly be pointed out again that both the duration of the phase of increased bactericidal power and the duration of the increased protection resulting from antityphoid inoculation are still uncertain) it would clearly follow that factors other than the increased bactericidal power of the blood come into consideration in connexion with increased resistance against typhoid which *is* conferred by inoculation. The mere fact of such other factors being involved would, however, not in any way diminish the force of the *a priori* arguments which point, as we have seen, to a connexion between increased bactericidal power and protection afforded.

Methods of inquiry by which the problem of the significance of negative and positive phases might be resolved.—The problem of the significance of the positive and negative phases which come under observation after anti-typhoid inoculation is a problem which, as consideration shows, is only one aspect of the more general problem of the rôle which the bactericidal substances of the blood play in the production of immunity. The solution of the particular problem before us might therefore with advantage be

sought by following up any line of inquiry which is likely to throw light on the general problem. Several such lines of inquiry suggest themselves.

One of these is to study the influence exerted on the bactericidal power of the blood by any factor which is known or surmised to diminish the resistance of the healthy organism to bacterial invasion.

Another method of inquiry which suggests itself is to determine by a system of appropriate blood examinations whether the outbreak of secondary septic infections which is so usual in plague and yellow fever is preceded by a diminution of growth-inhibiting effect which is exerted by the blood on the staphylococci, streptococci, and other micro-organisms which come into consideration in these cases.

And again much light might be thrown on the particular as well as upon the general problem now before us by studying the alterations in the bactericidal power of the blood occurring during the course of typhoid fever in their connexion with the favourable or unfavourable issue of the particular attack. While fully recognising that a trustworthy conclusion on such a question as this last can only be arrived at after prolonged study and after careful comparison of the results obtained by a series of different observers, I may perhaps put on record the fact that the result of such preliminary observations as I have been able to make in connexion with the prognostic significance of the bactericidal power of the blood in cases of typhoid fever are distinctly favourable to the view that the presence of a high bactericidal power is of good augury. By way of illustration I may refer to the observations recently made in a series of three cases of typhoid fever simultaneously under treatment in one and the same ward at the Royal Victoria Hospital, Netley. The patients in question when first seen on June 2nd were in a condition which in each case afforded ample justification for the gravest forebodings. Two of these patients were completely unconscious. In the case of one of these it had been necessary to inject ether to bring the patient back from a condition of absolute collapse, while in the other continual sponging had to be resorted to with a view to keeping down the temperature. The third patient, though he could be roused to answer questions, was in a condition of torpor, his general condition being apparently somewhat more favourable than that of the other two. Samples of blood were withdrawn, in each case from a prick made in the finger. In the case of the two first-mentioned patients a complete bactericidal effect was exerted by the serum on an equal volume of a five-fold diluted culture, this representing a destructive power in the case of each cubic centimetre of serum of between 840 and 2100 millions of typhoid bacilli. In the case of Patient 3 even the 100,000-fold dilution of the same culture was not sterilised. In other words, one cubic centimetre of this patient's serum would have failed to kill 42,000 typhoid bacilli. The issue of the cases was in conformity with these results. Patient 1 and Patient 2 made a good recovery, while Patient 3 succumbed within 12 hours after the sample had been taken for examination.

RESULTS OF ANTI-TYPHOID INOCULATION IN PERSONS CONVALESCENT FROM TYPHOID FEVER.

From the consideration of these possible lines of research we may now pass to deal with two further points of interest in the results tabulated above. The first of these arises in connexion with Patients 15 and 16 and relates to the effect produced by anti-typhoid inoculation in the case of persons who have recently convalesced from typhoid fever. As already indicated elsewhere, I have been able to confirm the earlier observations of Stern [13] that the bactericidal power of the blood in the case of convalescents from typhoid fever shows in some instances an increase and in others a diminution as compared with that found in the average man. We have, thus, after an attack of typhoid fever phenomena which seem to be quite comparable to, and which are probably to be explained in exactly the same manner as, those observed after inoculation with dead cultures of the bacillus typhosus.

Coming to the particular typhoid convalescents here in question it will be seen that in the case of Patient 15 the bactericidal power registered before inoculation was very considerable, being higher than that registered in 17 out of the 20 cases tabulated in the list. It will also be noted that in this case so far as can be judged no alteration in the sense either of an increase or diminution of the bactericidal power supervened upon the inoculation.

Quite different is the case of the convalescent indicated in the table above by the serial number 16. The Surgeon-on-probation in question developed typhoid fever very soon after he joined at Netley early in December, 1900. His attack was of average severity and was clinically well characterised. It was associated with a development of typical typhoid spots, diarrhœa, intestinal hæmorrhage, and a typical temperature curve. This last, after reaching 104° F., came down definitely to normal on the twentieth day.

The agglutinating and bactericidal powers of the blood were estimated on four occasions during the course of the fever. The agglutination, which was estimated in capillary sedimentation tubes with fresh living cultures of the bacillus typhosus, was in no instance complete in a dilution of 1 in 10, and only on one occasion were distinct traces obtained in a dilution of 1 in 40. In the case of the estimation of bactericidal power the gelatine method described by me in THE LANCET [14] was employed. In this method the bactericidal power is estimated by determining what is the highest dilution of the blood which, when mixed in equal volume with a gelatine containing an appropriate number of typhoid bacilli, will completely inhibit the growth of these last. In the case of the first estimation of bactericidal power—made by this method on the seventh day after the patient had taken to bed, the evening temperature on that day being 102° F.—the blood exerted a complete inhibitory effect in an 80-fold dilution, this value being about four times greater than that obtained with average normal blood. In the next observation, made three days later, when the temperature was lower after the intestinal hæmorrhage of the previous day, complete inhibition was obtained in a 160-fold dilution. From this point on the bactericidal power declined, a dilution of 1 in 20 being the lowest dilution with which complete inhibition was obtained six days later. In the last estimation, made on the day before the temperature finally fell below 99°, the lowest dilution with which complete inhibition was obtained was a dilution of 1 in 5; in other words, the bactericidal power was now equivalent only to a fourth of that of the average healthy man.

Convalescence having established itself in a satisfactory manner, the patient returned to duty early in March, 1901. His bactericidal power was then as recorded in the table estimated on three successive occasions. On each of these it was found to be much below the average. Influenced by this the patient now underwent inoculation with a small dose of freshly prepared typhoid vaccine. As will be seen on reference to the table the results of this were eminently satisfactory, his bactericidal power being increased at a minimum 400 times.

RESULTS OF ANTI-TYPHOID INOCULATION UNDERTAKEN WITH ANTI-TYPHOID VACCINE PREPARED FROM 18 TO 24 MONTHS BEFORE THE DATE ON WHICH IT WAS EMPLOYED.

A final and also practically important point which has to be considered in connexion with the present investigation relates to the effects of inoculation with samples of vaccine which, having been issued for respectively 18 and 24 months previous to the date of the present investigation, had been returned to stock after it had been kept for a considerable time in South Africa. Patients 17, 18, and 19 were inoculated with quantities equivalent to from one-half to a whole of the originally prescribed dose of the older of the two vaccines, designated by its serial number as Vaccine 3. Patient 20 was inoculated with a dose of Vaccine 6, equivalent to half the dose originally prescribed for use. It will be seen on reference to the table of results that in the case of Vaccine 3 a definite increase of the bactericidal power was obtained in two out of the three patients inoculated, while in the case of the remaining patient (Patient 17) no definite result was arrived at, the observation having been prematurely interrupted. In the case of Patient 20, who was inoculated with Vaccine 6, which had been prepared 18 months previously, only a negative phase came under observation. The observations were, however, here again prematurely interrupted. These results would seem to indicate that anti-typhoid vaccine

[13] Clinical Society, THE LANCET, March 16th, 1901, p. 786.

[14] THE LANCET, Dec. 1st, 1900, p. 1556.

retains its potency, or, at any rate, part of its potency, for a period of two years after it has been prepared.

SUMMARY.

It may serve a useful purpose, before concluding, briefly to summarise the facts ascertained in the course of the present investigation and to indicate certain important practical conclusions which would appear to follow from these facts, assuming always the significance of the alterations in bactericidal power which supervene upon inoculation to have been rightly interpreted.

With regard to the sequence of events after an anti-typhoid inoculation it has been shown:—

1. That where the quantum of antityphoid vaccine employed produces the familiar well-marked constitutional symptoms a decrease in the bactericidal power of the blood and a correspondingly increased susceptibility to typhoid infection may supervene in the period immediately subsequent to inoculation. Upon this negative phase of increased susceptibility there may, however, be expected to succeed, probably within a period of three weeks or less, a phase of increased bactericidal power and a greater resistance to typhoid.

2. That when the quantum of anti-typhoid vaccine employed produces very severe constitutional symptoms a negative phase of increased susceptibility will be produced, which—and the same would appear to hold true also in case of a negative phase supervening upon an actual attack of typhoid fever—may never be followed up by a positive phase of increased resistance.

3. That when the quantum of anti-typhoid vaccine employed is reduced to the point at which marked constitutional disturbance is avoided a positive phase of increased resistance may be expected to supervene without the intervention of any negative phase, and in many cases within 24 hours.

The following practical conclusions would appear to follow from the data set forth above.

Practical conclusions.—1. The employment in primary inoculation of large doses of vaccine—meaning thereby doses sufficient to give rise to very severe constitutional symptoms—would appear to be always inadvisable, while it would probably be associated with danger in cases where inoculation is resorted to in the actual presence of a typhoid epidemic.

2. The employment of moderate doses of vaccine—meaning thereby doses sufficient to give rise to marked but not unduly severe constitutional symptoms—would appear to be inadvisable when making primary inoculations in the actual presence of a typhoid epidemic. On the contrary, such doses would seem to be appropriately employed where an interval of several weeks is to elapse before exposure to infection and where there are difficulties in the way of carrying out two successive inoculations.

3. The employment of small doses of vaccine—meaning thereby doses which produce only a slight constitutional disturbance—would appear to be the only appropriate form of inoculation in the actual presence of typhoid infection. It would seem to be also in all other cases the most appropriate form of inoculation. Such primary inoculation ought, however, in all cases to be followed up by second inoculations within increased dose of vaccine.

It is to be noted that the procedure for increasing the bactericidal power of the blood which has just been recommended as that which seems dictated by the facts disclosed by the present investigation, is in all respects the same as that which is universally followed in the preparation of antitoxins and which is approved by the facts revealed by Ehrlich's fundamentally important researches on the sequence of events following the administration of tetanus toxin to goats. It would thus appear that the principle of the procedure recommended above is entitled to rank as a general principle of immunisation. As such it would, of course, apply not only to the anti-typhoid inoculations which are here in question, but also to all procedures for immunisation, and notably to the anti-plague inoculation introduced by Mr. Haffkine.

Of subordinate importance to the general theorems formulated above are the following which relate only to special classes of cases.

4. When the blood of a patient who has recovered from typhoid fever is found to possess a bactericidal power inferior to the average, and where re-exposure to typhoid infection is contemplated, it would seem advisable to secure for the patient the additional protection associated with the possession of a high bactericidal power. This additional security can, if it is permissible to generalise from the observations detailed above in connexion with Patient 16, be conferred by the inoculation of an appropriate quantum of anti-typhoid vaccine.

5. On the other hand, where the blood of a patient who has recovered from typhoid fever is found to possess a bactericidal power considerably above the average, it would, judging from the observations made in the case of Patient 15, taken together with certain other data in the table incidentally referred to below, appear to be impracticable to increase that bactericidal power by the inoculation of sterilised cultures.

6. Wherever a doubt as to the efficacy of a particular anti-typhoid vaccine arises—and such doubts may obviously arise, either in connexion with modifications introduced in the methods of preparing the vaccine or in connexion with prolonged storage of the vaccine under unfavourable circumstances—it will always be possible to arrive at a decision on the efficacy of the vaccine by observing the effect exerted by the vaccine in question upon the bactericidal power of the blood.

In conclusion, attention may be directed to the fact that it has been considered expedient to pass over in silence in the present communication one issue of fundamental importance which arises in connexion with the effect exerted on the bactericidal power of the blood by anti-typhoid inoculation. That issue arises in connexion with the question as to whether the bactericidal effects registered are the resultant effects of two different kinds of protective substances acting in conjunction. In connexion with this it may be merely noted here that there appears to be a very definite limit beyond which the bactericidal power of the blood cannot, it would seem, be increased by inoculation with sterilised cultures of the typhoid bacillus.

Netley.

TUBAL GESTATION SAC ENTIRELY ANTERIOR TO THE UTERUS; OPERATION; RECOVERY.

BY ALBAN H. G. DORAN, F.R.C.S. ENG.,
SURGEON TO THE SAMARITAN FREE HOSPITAL.

IN tubal gestation the sac in the earlier months of pregnancy nearly always fills Douglas's pouch and more or less of the lateral fornix on the side where it developed. Thus, when the other symptoms of extra-uterine pregnancy are present, a swelling to the left of the cervix usually signifies that the left tube is the seat of gestation. Experience has shown, however, that a tubal sac may be displaced so as to lie on the opposite side of the pelvis. Taylor noted this kind of displacement in one of his own cases.[1] A left tubal pregnancy caused a right iliac hæmatocele. A woodcut illustrates the relations of the tube to the uterus as discovered by Taylor. In 1899 I operated on a similar case. The sac, though developed in the right tube, lay to the left as well as behind the uterus, which was pushed up together with the left tube and ovary.[2] This was the condition described by Taylor but with the sides reversed, which shows that a right or a left sac may alike extend across to the opposite side of the pelvis. I have observed transposition of this kind in cases of unilateral hydrosalpinx and in instances where a small heavy ovarian tumour lay in the pelvic cavity.

Still, whether the tubal sac lies on its own side or crosses the pelvis, it almost invariably occupies Douglas's pouch, that is to say, it lies behind the uterus. In the case which I am about to relate the sac lay in front of the uterus. I find that Taylor has also distinguished this rare relation of sac to uterus. "When the uterus is much retroflexed the tumour may even be found in the front half of the pelvis, the pregnancy lying altogether anterior to the uterus. In this situation the tumour is very accessible to the bimanual examination, provided the bladder be empty. (The use of the catheter is always an important preliminary to a thorough examination of the pelvis.)"[3] The last sentence, placed in

[1] Extra-uterine Pregnancy, p. 32, and Fig. 14.
[2] Tubal Mole. Fœtus Three-quarters of an Inch in Length. Transactions of the Obstetrical Society of London, vol. xlii., 1900, p. 134.
[3] Loc. cit., p. 105.

parentheses, is indeed good counsel. Let it be noted that in the following case, though the position of the swelling was very exceptional, the other symptoms of tubal gestation were so clearly marked that all who examined the patient correctly diagnosed that condition. Before operating I myself bore in mind the observations of Taylor just quoted. Another interesting feature of this case was the adhesion of an inflamed vermiform appendix to the tubal sac. Its relation to the unusual position of the sac deserves consideration.

The patient, aged 29 years, who had been married for nine years, was admitted into Charing-cross Hospital on June 20th, 1901, for hæmorrhage and pain in the left side. She had borne three children; the last was delivered at the eighth month on Nov. 1st, 1900, and died from convulsions when 12 days old. No miscarriages had occurred. Dr. Amand Routh reported that six weeks before admission, when she had gone two weeks over her period, "show" appeared and continued scantily till the seventh day. Then sudden profuse hæmorrhage occurred with severe pain in the left iliac fossa. The bleeding continued till admission and there were several fresh attacks of pain so severe as to cause fainting, but the patient never kept her bed in the daytime. Dr. Routh dilated the cervix under an anæsthetic on the 21st. The uterus was curetted but nothing except a considerable amount of blood came away. On bimanual palpation under the anæsthetic a swelling could be found quite anterior to the uterus which was somewhat retroverted. Douglas's pouch was empty. By July 2nd this swelling was larger, reaching across the pelvis between the bladder and uterus; it was of the size of a fist. The patient had slight dysuria. Some urine was drawn off by the catheter and clots of blood came away in the eye of that instrument. The urine was normal and under the microscope only a few scattered red corpuscles were seen. On the 6th the swelling was harder and more fixed, but not larger. Dark blood came away freely and there was much show on the 12th when, on account of the closing of the wards of Charing-cross Hospital, she was transferred to my care at the Samaritan Free Hospital. Tubal gestation was correctly diagnosed by Dr. Routh who like myself was puzzled by the entirely anterior position of the swelling. The temperature had never risen above 100·4° F.; after she was under my observation the maximum was 98·6°.

I examined the patient on the 13th. The mammæ were flat; no milk exuded from the nipples on pressure. An oval mass of the size of a turkey's egg lay in front of the uterus, turning backwards towards the right fornix; the left was perfectly free. The uterus was pushed backwards, the cervix pointing forwards. Dark powdery clot escaped freely from the os externum. The parts were very tender to touch. The patient suffered from frequent desire to micturite; the urine drawn off by the catheter was turbid, brownish yellow, acid, of specific gravity 1025; no precipitate formed on boiling with nitric acid. There was no clot in the urine. The catheter was passed several times daily. The catamenia until a fortnight before the present illness had been quite regular, appearing every four weeks and lasting about six days, with much pain and scanty bleeding. The first labour, six years previously, was instrumental, the second, three years since, and the third, eight months since, were natural. No puerperal trouble followed any of the labours and the patient had never suffered from any illness or from any local pain except during the period. The tongue was clean and the bowels were rather constipated. I could not obtain any clinical history indicating inflamed appendix. There could be little doubt that ectopic gestation existed without hæmatocele. The flow of powdery brown clot continued.

On the 23rd I operated, assisted by Mr. W. S. Handley. The patient was placed in the Trendelenburg position. A mass of irregular shape rose out of the pelvis; it was of a deep orange-red colour. The omentum adhered to it; there was no free blood or clot in the peritoneal cavity. The mass was evidently a dilated tube; the vermiform appendix much thickened and elongated, adhered to it. The tubal tumour was strongly adherent to the whole of the fundus of the bladder, from which it was separated without laceration of the vesical walls, but the tumour itself was torn and a few drachms of old clot escaped. The tumour consisted of the dilated left tube bent round to the right, its posterior aspect adhering to the bladder and its front part to the uterus which was retroverted. The left infundibulo-pelvic ligament was greatly elongated, looking like a tube. I tied the ovarian vessels in that ligament and ligatured the tube close to the uterus, separating the adherent appendix; then the tube was amputated with its ovary. There was much oozing, which was stopped by pressure, after separation of a piece of the wall of the tube which strongly adhered to the bladder. The appendix was amputated close to the cæcum, a cuff of its peritoneal coat being sewn over its cut end. The right tube and ovary seemed quite healthy; they were separated from soft adhesions to the bottom of the pelvis.

The patient made a speedy recovery without fever. The urine was smoky during the first 24 hours. The frequent desire to micturite ceased directly after the operation, as did the show of blood. From the end of the third day the urine was passed naturally; at the same time a true period began, with light blood in small quantity and molimen, which lasted three days. There were no signs of peritonitis and no trouble with the bowels.

Mr. Handley carefully examined the specimen. The middle part of the tube was greatly dilated and contained clot, most organised at the periphery; the outer part was also dilated; the two segments were separated by a deep constriction. The ovary was small and contained a recent corpus luteum. The clot adherent to the wall of the dilated middle segment of the tube contained well-marked chorionic villi. The specimen was sent to the museum of Charing-cross Hospital. It was a typical unruptured tubal mole.

Regarding the adhesion to the vermiform appendix, it is easy to understand how, owing to the local peritonitis caused by tubal gestation, the appendix may contract adhesions to the sac. In chronic inflammation of the tube and ovary such adhesions are frequently seen, and appendicitis may infect the tube and set up pyosalpinx. This question is not to the point in the present case, as there was neither abscess in association with the sac nor suppuration beginning in or around the appendix. The clinical history and the appearances observed at the operation alike tended to prove that the disease of the appendix was secondary; it could not cause the tubal pregnancy nor was there evidence that it represented a coincident disorder. Secondary inflammation of the appendix and intimate adhesion involve in many cases so much damage to the appendix during an operation that its amputation is necessary, as in one case in my own practice where a fæcal concretion escaped during the detachment of the tip of the appendix from a diseased right Fallopian tube. Often, however, the appendix may be saved, particularly where the tube is not suppurating. In the present case the appendix adhered to the left tube converted into a fœtal sac. Adhesion of this kind to an inflamed left tube or ovary is not unknown. About a year ago I excised a tuberculous vermiform appendix strongly adherent to an inflamed left ovary which was bound down very low in Douglas's pouch by firm adhesions. The ovary contained a large blood cyst which seemed to account for the deep-seated pelvic pain from which the patient, a single woman, aged 22 years, suffered. She was perfectly regular and there was no question of pregnancy. Had there been a gravid left tube instead of an "apoplectic" ovum the appendix would assuredly have adhered to the sac. In the present case the adhesion of the appendix to the sac seems to have occurred after the sac had swung round in front of the uterus and to the right so that its outer extremity came close to the tip of the appendix. Had the adhesion occurred whilst the sac was still in the left side of the pelvis the appendix would most probably have guided the sac to the right but backwards and not in front of the uterus; nor is it likely that, as in this case, the right appendages would have remained absolutely in their normal situation.

Granville-place, W.

THE VACCINATION ACT.—At the meeting of the Warmley Board of Guardians held on Sept. 3rd a communication was read from the Local Government Board stating that the vaccination officer did not make the personal inquiries required by the Vaccination Act and that he did not prosecute defaulters. The letter added that the public vaccinator only vaccinated in two places instead of four, and requested an explanation from the guardians. After a considerable discussion it was decided to acknowledge the letter and to intimate that the guardians would give their careful consideration to the matter.

THE POST OFFICE AND THE PREVENTION OF TUBERCULOSIS.

BY CHARLES H. GARLAND.

IT is a matter of which the Post Office can be rightly proud that the better recognised forms of contagious disease are rare among the huge staff of employés. The fact reflects some credit on the methods adopted for exclusion and disinfection. But the same fact brings into remarkable prominence the entire lack of organisation for the prevention of tuberculosis. In giving evidence in 1895 before a committee presided over by Lord Tweedmouth I tendered facts to prove that there was a relatively high mortality from phthisis among at least one section of the postal employés and prepared tables to illustrate my contentions. Although these tables have been given an improper significance in the popular press—a significance which I never desired to attach to them—I still think they are nevertheless indicative of a very serious condition of affairs. The figures were drawn from the reports of an insurance society which is confined entirely to Post Office officials, and the membership is sufficiently numerous to be typical of the whole staff. The present membership numbers 19,180. The tables, which were based on 10 years' returns, showed that of every 100 deaths among sorting-clerks and telegraphists between the ages of 15 and 65 years, 45·4 were due to phthisis. This high percentage may be due in part to the exclusion of other diseases, but the significance from our present standpoint lies in the fact that although tuberculosis is so eminently preventable, nevertheless so large a percentage of the deaths is caused by it. It was contended, in reply to these figures, that the membership of the insurance society from which the figures were drawn consisted of damaged lives. I have looked carefully into this contention but see no reason for doubting the substantial accuracy of the figures. It is true that the death-rate among the members of the society is higher than among the postal staff as a whole, but the higher mortality is adequately accounted for by the fact that whilst the postal staff includes an immense number of employés between the ages of 15 and 30 years a very small percentage joins the insurance society before 30 years of age. The mortality of the society thus misses the leaven of the period of low mortality.

The ratio of deaths from phthisis to the total mortality does not, of course, necessarily mean a high mortality, but an examination of official figures for the whole postal staff will show that the mortality from tuberculous disease is absolutely as well as relatively high. Following upon the evidence tendered to the Tweedmouth Committee tables were given in the annual report of the Postmaster-General showing the deaths from phthisis and the superannuations from the same cause. The official figures published under these heads show that the mortality from tuberculous disease is appreciably higher among the postal staff than among the general populace. From the figures supplied during the years in which information was given I have constructed the following table. It refers to the whole of the established postal staff, male and female, and covers the whole of Great Britain and Ireland:—

Table showing Loss from Phthisis.

Year.	Staff.	Deaths from phthisis.	Retirements from phthisis.	Total.	Loss per 1000 living in the Postal Service.	Loss per 1000 living in the general populace.
1896	62,852	86	67	153	2·4	1·3
1897	76,966	72	80	152	1·9	1·3
1898	79,121	70	87	157	1·9	1·3
1899	82,172	62	83	145	1·7	1·3

In this table I have added together the deaths and the cases of retirement from phthisis. Knowing the conditions of retirement in the Post Office, it is impossible to suppose that an appreciable number of those retired escape death. Retirement is, in fact, indicative of imminent decease. In each of the four years recorded the loss from phthisis is higher than the mortality of the general populace from the same disease. But there are considerations which make this loss even more serious than is at first apparent. Every life in the Post Office is a selected life. As a commentary on the above table it is sufficient to take one or two statements made by Postmasters-General. In the forty-first report, 1895, the Postmaster-General says: "The Post Office staff consists of selected lives, candidates being required to pass a medical examination before they are admitted to the public service," and in the forty-second report the following words occur: "In the Post Office there ought to be a smaller number of deaths per 1000 than would be found in a similar number of persons engaged in somewhat similar occupations elsewhere." I should have liked to compare the mortality of the Post Office with similar trades had it been possible. But the Post Office is a congeries of trades and professions and the official figures are not classified. The whole are lumped together as though the employés were one uniform class performing identical work under identical conditions. The need for some classification will be obvious from the following description of the staff and its work culled from the Postmaster-General's forty-first report. "The Post Office population is distributed unequally among different ages and between both sexes, excluding the very young and very old. It consists of selected lives, candidates being required to pass a medical examination before they are admitted to the public service, and the nature of the work varies from duties of a light and pleasant character to some which involve strain, exposure, and break of rest." Apart from the selection of lives this description would more accurately fit the general populace than any single trade or profession. So I propose that the figures should be compared with the mortality from phthisis among the general populace; compared in this way it is found that the loss from phthisis among the selected lives of the Post Office is appreciably higher than the loss among the general populace, which stands at about 1·3 per 1000 living.

As there seems to be a progressive decrease in the loss from phthisis in the Post Office from 1896 to 1899 it is well to mention that a decrease not shown in the first decimal place occurred in the general mortality. The decrease in the Post Office was not entirely due to any new precautionary measures. The table which I have given shows, however, that there was a progressive increase in the number of retirements after the evidence given in 1895 and a corresponding diminution in the number of deaths, a fact which proves how close is the relation between the two sets of figures and fully justifies my method of computing the total loss from phthisis.

It would be a work of supererogation to endeavour to prove that such a condition of affairs requires attention, nor is it necessary to dwell on the facilities which exist for prevention in a department organised and controlled like the Post Office. It is surely the duty of the State to lead the way in the adoption of preventive measures and by force of example to urge other large employers to adopt like measures. Yet it is safe to affirm that practically no measures are used to prevent tuberculosis in the Post Office. In the General Post Office itself it would be difficult, if not impossible, to find a single spittoon or a prohibition against expectoration. Speaking from personal observation I can say that even known consumptives openly and freely expectorate in all parts of the galleries where the minor establishment works—dust is allowed to accumulate on the walls and to remain for months and even years. All the buildings of the postal department must be contaminated. Even the ventilation is left to the haphazard whims of the employés instead of being in charge of a properly qualified officer. I have reason to believe that some classes of the work especially predispose to phthisis but it is enough for my purpose to show that absolutely no preventive measures exist in the buildings where any class of work is performed.

This lack of precaution is especially striking in view of what has been done in the French Post Office. As the conditions are so markedly analogous I will refer to the report recently presented to the Minister of Commerce by Dr. Mignot upon the application of preventive measures to the postal and telegraph departments, and the decrees issued for the purpose of giving practical effect to his recommendations. Basing his report on the conclusions of the Commission on Tuberculosis, Dr. Mignot says: "The Commission was occupied for some time in considering the danger arising from this contagion among more or less numerous bodies of

men working in common in a limited space. A single tuberculous subject soiling the floor with his expectorations will then render the place of work dangerous for years to come, and communicate his disease to hundreds of others. But this danger can be reduced almost to nothing by a series of protective measures. The enemy is well known and the means of combating him are sure. In this struggle corporate bodies, and especially State corporations, have effective arms at their disposal; and, in addition, it is their duty to set an example and to instruct by their example. During the year 1899, out of nearly 71,000 employés of different grades in the posts and telegraphs of France 200 were certified as having died from tuberculosis, and 68 were retired on account of the same complaint, making a mortality of 28·1 per 10,000, and a loss from tuberculosis of 40 per 10,000, for it cannot reasonably be supposed that a very large number of those retired escaped death. The general mortality from all diseases during the years 1897, 1898, and 1899 was 1557, and the number of deaths from tuberculosis 561, without reckoning retirements, or about 36 per cent.—that is to say, out of 100 deaths tuberculosis causes 36. At first sight this mortality does not appear excessive. It is higher, however, than the average in France, which is 34 deaths from tuberculosis in 10,000 inhabitants instead of 40 per 10,000 for the postal and telegraph employés. It must be remembered that the postal and telegraph employés undergo a medical examination before admission, which excludes the weak and sick. In these circumstances the mortality should be below the average, yet it seems to be sensibly above it. This fact is much plainer when we take the figures for a single department of the Seine. In 1899, out of 1500 employés 43 died and 50 were retired on account of tuberculosis, or a loss of 62 per 10,000. The general mortality from tuberculosis in Paris is 49 per 10,000."

Dr. Mignot's report recommends certain preventive measures. First, there are the measures concerning the buildings, and second, the measures concerning the staff. The first set of measures can be thus summarised. It is of the first importance to prevent as far as possible the contamination of the buildings. It should be easy to teach the staff that in the offices contagion is caused exclusively by expectorations, which dry and mix with the dust of the air and penetrate into the lungs. Thus, every tuberculous subject who spits on the floor sows death among his comrades. A corollary would be the absolute prohibition of spitting except in hygienic spitoons, a sufficient number of which should be placed in convenient spots. This prohibition should extend to the vestibules, corridors, cloakrooms, water-closets, staircases, and even to the courtyards of the department. Having taken precautions against contamination of the buildings it must be remembered that the majority of them are already contaminated, and that despite precautions new contaminations may occur. In every office where the presence of a tuberculous subject has been reported a careful disinfection should take place. It is absolutely essential to change the daily method of cleaning the offices. We know that only dried expectorations are dangerous; and dry sweeping, or nearly dry sweeping, as it is now practised, is a perfect method of disseminating them in the air. In every building where tuberculous subjects can spit on the floor the broom is a terrible engine of death. It is absolutely essential to replace sweeping by washing with damp cloths in the manner now employed in barracks, and more recently at police-stations. Beyond the daily cleaning with damp cloths it would be well to have a thorough weekly washing; the ideal method would be to wash not only the floors but also the walls and ceiling. To be perfectly efficacious the washing presupposes the impermeability of the floors. The methods of obtaining this result are numerous and some of them extremely cheap. The flooring of the offices should be rendered impermeable and especially the floors of those offices into which the public are admitted. In the latter a thorough washing with water every day should be prescribed. No building of the department at present possesses the least organisation for avoiding tuberculous contagion; not one, even among the newest, shows any sign of the consciousness of the danger. Everywhere are to be found angles, corners, open-work iron beams, and lustres of complicated ornamentation, carefully storing the injurious dust that a current of air will later on scatter upon the heads of the employés. Everywhere are walls, ceilings, and floors difficult or impossible to wash. Everywhere are dark colours which hide the dirt.

The second set of recommendations deals first with the rigid exclusion of tuberculous subjects and tuberculous suspects by a more searching examination. We must, says Dr. Mignot, prevent tuberculous subjects from entering the service of the department, eliminate and treat all those who are already there, and give to all the employés special instruction by which they will be able the better to avoid contagion. He then goes on to plead for a better statistical system and the more accurate description of complaints in the certificates and registers. The department should know its invalids and the complaints from which they suffer. Knowing them it is necessary to treat them. A sanatorium alone can procure everything indispensable to their cure. This will involve a tolerably heavy expense, for the number of tuberculous patients must be equal to at least three or four times the number of dying or retired annually. There must be from 900 to 1000 for the whole of France, and 300 to 400 for the Department of the Seine alone. The daily expense for a consumptive patient in hospital is about 4f. 50c., reckoning the capital sunk in the establishment. In addition, for married patients with a family there must be reckoned an allowance of not less than 1f. 50c. per day. (These figures are those of the popular sanatoria of Germany.) "Nevertheless," goes on the report, "we cannot allow consumptives in the earlier stages of their complaint, and quite curable, to die without hope. We cannot condemn to nearly certain death hundreds of men often infected during their work and by their work. Still less can we, as at present, not only not treat them, but allow them to spread contagion and death in the ranks of their comrades."

Finally, it is necessary to teach the employés the causes and modes of propagation of tuberculosis. Printed notices should be distributed to all the staff. Very succinctly they should be told how the bacilli of tuberculosis thrown on the floor in the sputum of consumptives dries and mixes with the dust of the air, penetrating the lungs during inspiration and there developing and producing tuberculous lesions. It should be explained how easy it is to avoid contagion if each of them individually will observe carefully the hygienic measures above described.

Following on this report decrees were immediately issued giving effect to all its recommendations, and a most concise and lucid notice[1] was issued to every member of the staffs and posted prominently in all parts of the buildings.

I have quoted lengthily from this report in order to show how an analogous set of circumstances was treated in France. The report deals with the same classes of work and workers and the administration has to encounter the same difficulties as the English administration. In addition the report sets forth plainly and simply the necessary precautions which should be taken in England. The large administrations employing vast numbers of men and women should be made to realise the sacred responsibility which the lives of these men and women represent. A life sacrificed to a preventable disease is a wasted life. If no precaution is taken against the disease a heavy part of the responsibility must rest with the administration.

[1] This notice is so striking and yet so brief that it would not be out of place to append a translation:—"*Notice Concerning the Propagation of Tuberculosis.*—Tuberculosis kills in Paris alone over 13,000 persons every year. In provincial towns and country districts it is far from rare. Nevertheless, it is known that it is caused entirely by contagion; all the modes of contagion are known, therefore it is preventable. In nearly every case the propagation occurs in the following manner: A tuberculous subject spits on the floor and the sputum dries. The microbes of tuberculosis are to be found in the sputum in myriads and when dry can remain alive for many years, always ready to germinate like a seed. They mix with the dust of the air, and if this dust is drawn in during respiration the microbes penetrate into the lungs, develop there, and produce the disease. No age or constitution is secure from these attacks. It is, therefore, in the interest of all to watch over the observance of the following precautions: 1. It is strictly forbidden to spit on the floor in the buildings of the Post and Telegraph Department. 2. Dry sweeping is prohibited. The floors must be cleaned with damp cloths."

WATER-SUPPLY OF WESTBURY.—The new waterworks which have been recently erected at Westbury, Wiltshire, were formally opened on Sept. 4th. The cost of construction has been about £13,000.

EXTENSION OF THE CITY OF BATH.—The City Council of Bath on Sept. 4th adopted the recommendation of a special committee that the city should enlarge its boundaries in order to include several populous suburbs. The population of Bath has decreased by 4000 during the past 20 years, whilst that of the surrounding districts has increased by 12,000.

SOME POINTS IN THE PATHOLOGY OF PERNICIOUS ANÆMIA.

BY WILLIAM BAIN, M.D. DURH., M.R.C.P. LOND.

RESEARCHES by Hunter, Stockman, and others have of late drawn increasing attention to the pathology of pernicious anæmia. The cause of the disease has not been proved beyond doubt, but the facts are sufficient to foreshadow its nature. Noteworthy theories of causation are those of Hunter, Stockman, and Mott. Hunter holds that a toxin produced by a special micro-organism in the alimentary canal is absorbed and causes a disintegration of the red blood corpuscles in the portal area. The liberated iron is stored in the liver, spleen, and other organs, while the blood pigment is excreted in the bile and urine. But even in health he finds that the red cells become disintegrated in the portal area. This occurs mainly, in relative order of importance, in the spleen, liver, and the portal blood itself. Stockman's view is that pernicious anæmia is not a disease *per se*, but supervenes when an ordinary anæmia, long continued and profound, induces in certain individuals vascular degenerative changes resulting in widespread capillary hæmorrhages. This drain, sometimes aggravated by larger hæmorrhages, determines the special type of the disease, with its characteristic lesions and generally fatal issue. Stockman, in criticising the theory of Hunter and Mott as to a hæmolytic action of the liver, asserts that the liver ordinarily has no blood-destroying function, but is the storehouse for the physiological iron of the body. Its cells take up the iron derived from the food and effete blood corpuscles. He refers to Minkowski's observations, made after poisoning with arseniuretted hydrogen, that the leucocytes in the liver, the spleen, and the bone-marrow carried broken-down corpuscles, whereas in the blood of other parts this phenomenon was rare. Mott regards pernicious anæmia as essentially an excessive activity of the normal blood-destroying function of the liver and spleen. This theory may be taken to predicate the formation within, or introduction from without, the organism of some agent which stimulates the hæmolytic function and thus practically comes into line with Hunter's opinions.

Before discussing certain points in these theories a case of pernicious anæmia in which the urine was analysed daily for a time may be described, with, by way of contrast, a case of chlorosis similarly observed. I desire to thank Dr. A. G. Barrs for the opportunity to investigate these two cases.

CASE 1.—A man, aged 36 years, a turner by trade, was admitted to Leeds Infirmary on Sept. 24th, 1900, suffering from pernicious anæmia. He was a married man with four children and had always possessed a comfortable home. His previous history was unimportant. When he was eight years old he had some enlarged cervical glands removed. His present illness began insidiously and was of about four years' duration. At the outset of each summer he gradually lost his appetite and had no desire for work. There was also gradual weakness sufficient to make even walking an effort. His skin assumed a yellow tint. He suffered no pain, except at certain times during the penultimate summer, and it was then associated with defecation. On several occasions during the following summer he noticed blood and mucus in his motions, but there was an absence of pain. After food he suffered from nausea, with occasional vomiting at night. There was also marked depression of spirits, but great improvement always followed a good night's rest and he took a fair breakfast. At no time was there any palpitation or shortness of breath. Towards the end of August he had his annual holiday, after which he returned to work much improved in health—an improvement maintained throughout the winter. In the last autumn, however, this cycle was disturbed. He was unable after his holiday to resume work, which had been exceptionally heavy before he went away. In the middle of last August he first suffered from palpitation, supervening on the slightest exertion. General weakness now became so marked that even standing was difficult owing to vertigo. In the latter part of the month his sight grew dim and his sense of hearing became blunted. On taking medical advice he was ordered to bed and thenceforth could not even sit up without great difficulty. During the last few weeks there had been numbness in the hands and feet. He stated when seen that on the previous Saturday evening he was delirious and talking incoherently. He was aware at the time that the words used were not those intended and felt some insurmountable difficulty in expressing himself correctly. At the time his hands and feet felt cold and numb.

On examination the patient seemed about 50 years of age. He lay flat in bed, his condition being one of extreme weakness. He was in the habit of sleeping the greater part of the day. The patient's voice was weak and hoarse. The pallor of the skin was striking, the tint being a dirty yellow. The tongue was small, pale, and clean. The bowels had been constipated, but during the period of investigation they remained regular. The appetite was described as miserable and the teeth were in a bad condition. The abdomen was retracted and there was marked systolic pulsation. In the right upper quadrant there was some slight suggestion of fulness. The spleen could not be felt. The pulse was rapid, fairly full, and moderate in tension. There were a systolic murmur audible at the apex of the heart and the usual murmurs at the base. Numerous hæmorrhages were present in both retinæ. The knee-jerks were absent and the plantar reflexes were increased. Sensation to touch, heat, and cold was good, but to pain it was blunted. The extremities were cold. A small dilated venule was found at the anus, but there were no hæmorrhoids. Insertion of the finger caused some pain. There was no other ascertainable source of blood loss. On Sept. 26th a blood count gave 970,000 red cells per cubic millimetre. The leucocytes were not increased, being mainly of the mononucleated variety. The hæmoglobin was not estimated. On the 28th the red corpuscles were estimated as 880,000 per cubic millimetre. On the 29th the temperature was 101° F. and the pulse was 100. On the 6th the pulse was hyperdicrotic. On the 11th the patient was much better, taking his meals with pleasure and his colour showing a marked improvement. 1,670,000 red cells per cubic millimetre were estimated. On the 20th the red cells numbered 2,400,000 per cubic millimetre. The patient was progressing favourably. For two mornings he had passed a small quantity of blood in his motions. The pulse was 80. On Nov. 22nd the red cells were estimated as 3,240,000 per cubic millimetre and the hæmoglobin as 72 per cent. On the 24th the patient was sent to a convalescent home and he was finally discharged on Dec. 29th. The patient's weight on Oct. 24th was 9 stone 5 pounds and on Nov. 27th it was 10 stone 3½ pounds. For treatment he had Hommel's hæmatogen, arsenic, and oxygen inhalation for 10 minutes twice daily. Later the lower extremities were massaged.

CASE 2.—A domestic servant, aged 22 years, was admitted into the Leeds Infirmary on Jan. 17th, 1901, suffering from chlorosis and gastric ulcer. There was a history of a previous attack of anæmia. The present attack dated from the beginning of the previous November and was attributed by the patient to unsuitable food. In addition to shortness of breath, palpitation, pain after food, and occasional vomiting, she had œdema of the lower extremities. The tongue was furred. At the apex of the heart a systolic murmur was audible. There was conduction towards the axilla, but the bruit could not be heard at the back.

Methods of analysis.—The urea was estimated by the hypobromite method, the uric acid by Hopkins's process, and the phosphorus pentoxide by titration with uranium acetate. For the estimation of the acidity titration with decinormal caustic soda was adopted, phenolthalein being the indicator. The sulphates were estimated as follows: to 200 cubic centimetres of filtered urine 10 cubic centimetres of hydrochloric acid were added, followed by an excess of a saturated solution of barium chloride. The flask was shaken and the precipitate allowed to settle. It was then separated by filtration and washed chloride free with distilled water. The filtrate and washings were boiled for 15 minutes and allowed to stand over night. In this case also the precipitate was washed chloride free with hot distilled water. Both precipitates were further washed with alcohol and ether, dried, incinerated in a weighed capsule, the filter papers being of known weight. For the detection of indican Jaffe's, Obermeyer's, and Weber's methods were used, the last being considered the best. For urobilin, Garrod's and Hopkins's method was employed—namely, by removing the urates with ammonium chlorides, acidifying the filtrate with sulphuric acid, and saturating with ammonium sulphate. The pigment may be purified by dissolving the precipitate in distilled water and re-saturating with ammonium sulphate.

For extracting the pigment one part of chloroform and two parts of ether are used. Garrod's second process was also used and the solution obtained was submitted to spectroscopic examination. For the detection of hæmatoporphyrin Garrod's method was adopted—20 cubic centimetres of solution of caustic soda were added for every 100 cubic centimetres of urine, the latter amounting to over a litre. The precipitate was dissolved in a small quantity of alcohol containing hydrochloric acid and the solution was examined with the spectroscope. The presence of skatoxyl sulphuric acid was inferred from the appearance of a dark red tint on adding hydrochloric acid, a cherry red being obtained with nitric acid and a red colouration on warming with ferric chloride and hydrochloric acid. Blood films were prepared in the case of pernicious anæmia and fixed with alcohol and ether. They were subsequently stained with eosin and toluidine. The results obtained by the above methods are indicated in the table subjoined.

TABLE SHOWING THE ANALYSIS OF THE URINE IN 24 HOURS IN CASES OF PERNICIOUS ANÆMIA AND CHLOROSIS RESPECTIVELY.

Date.	Quantity in cubic centimetres.	Specific gravity.	Urea in grammes.	Acidity in terms of oxalic acid in grammes.	Uric acid in grammes.	Phosphoric acid in grammes (P_2O_5).	Preformed sulphates in grammes.	Conjugated sulphates in grammes.	Urobilin.	Indican.	Hæmatoporphyrin.	Skatoxyl sulphuric acid.
Pernicious Anæmia.												
Nov. 5th, 1900	1380	1·025	42·78	4·78	0·525	2·69	3·05	0·341	Markedly increased.	Increased.	—	Increased.
,, 6th, ,, ...	1930	1·016	40·13	5·32	0·710	2·97	3·12	0·392	—	,,	—	,,
,, 7th, ,, ...	1080	1·024	30·62	3·62	0·543	2·27	2·32	0·394	Markedly increased.	,,	—	,,
,, 8th, ,, ...	1140	1·026	33·06	3·84	0·581	2·22	2·77	0·325	—	,,	—	,,
,, 9th, ,, ...	1300	1·020	33·80	3·80	0·537	2·21	2·53	0·312	Markedly increased.	,,	—	,,
,, 10th, ,, ...	1320	1·021	29·92	3·42	0·576	2·17	2·23	0·307	—	,,	—	,,
,, 11th, ,, ...	1940	1·015	27·60	2·89	0·553	2·15	2·12	0·282	—	,,	Normal.	,,
,, 12th, ,, ...	1320	1·020	32·11	3·87	0·614	2·43	2·58	0·364	—	,,	—	,,
,, 13th, ,, ...	1270	1·019	33·02	3·62	0·594	2·18	2·76	0·321	Markedly increased.	,,	—	,,
,, 14th, ,, ...	1465	1·020	28·21	3·40	0·603	2·21	1·86	0·211	—	,,	Normal.	,,
,, 15th, ,, ...	1570	1·022	30·16	3·64	0·586	2·24	2·31	0·326	Markedly increased.	,,	—	,,
,, 16th, ,, ...	1410	1·021	29·42	3·16	0·592	2·25	2·29	0·337	—	,,	Normal.	,,
,, 20th,* ,, ...	1200	1·025	33·60	3·93	0·705	2·92	2·47	0·349	Markedly increased.	,,	—	,,
,, 21st,* ,, ...	1140	1·026	34·92	3·83	0·696	2·86	2·71	0·414	—	,,	Normal.	,,
Chlorosis.												
Jan. 20th, 1901	1840	1·017	29·44	3·01	1·08	2·49	1·89	0·139	—	—	—	—
,, 21st, ,, ...	1880	1·020	30·24	3·02	1·21	2·64	2·19	0·163	—	—	—	—
,, 23th, ,, ...	1915	1·018	29·75	2·78	1·48	3·09	1·58	0·127	—	—	—	—
Averages.												
Pernicious anæmia			33·06	3·78	0·583	2·35	2·50	0·325	—	—	—	—
,, ,, after chloralbacid...			34·36	3·88	0·700	2·69	2·50	0·381	—	—	—	—
Chlorosis			29·81	2·93	1·25	2·74	1·88	0·139	—	—	—	—

* After the administration of chloralbacid.

The examination of the films revealed the usual characteristics of the blood in pernicious anæmia. There was only a very moderate degree of poikilocytosis; the nucleated red corpuscles were few in number and the normoblasts slightly preponderated over the megaloblasts. The lymphocytes were above and the polymorphonuclear leucocytes below the normal proportion. A few scattered microcytes were also seen.

It will be observed that the excretion of uric acid in pernicious anæmia is slightly below the normal average, while in chlorosis it attains the normal maximum. It is stated by careful observers that the uric acid excretion is often increased in pernicious anæmia. This rise appears to be coincident with an exacerbation as shown by an advance in the rate of the destruction of the red blood corpuscles. The increased uric acid excretion is therefore probably of endogenous origin—due to increased destruction of some tissue rich in nucleins. The cells destroyed may be the leucocytes, or, on the other hand, the cells of tissues concerned in the formation or the destruction of the red blood corpuscles. There is much in favour of the hypothesis that the cells yielding the excess of uric acid in this disease are the nucleated red blood corpuscles.

The acidity in these cases does not appear to be related in any way to the uric acid excretion. Pathologically, the most important feature of the results is the relative increase in the conjugated sulphates in pernicious anæmia. The normal relation between the conjugated and the preformed sulphates is roughly as 1 to 10. In the case of pernicious anæmia it was as 1 to 7, and in the case of chlorosis as 1 to 13. The increase in ethereal sulphates in this affection indicates albuminous putrefaction in the intestinal canal. In chronic constipation they are occasionally increased, but a dose of calomel reduces them to the normal proportion. In the pernicious anæmia case it was considered inadvisable to administer a laxative antiseptic, and chloralbacid was given instead. It is a moderately powerful intestinal disinfectant composed of albumin and chlorine, but its exhibition did not diminish the excretion of ethereal sulphates. It was given for three days before the urine was analysed. The increase in ethereal compounds in conjunction with a clean tongue, as compared with a decrease and furred tongue in chlorosis, must be regarded as of great significance. The other interesting features of the urinary analysis in this connexion were the increased formation of indican, skatoxyl, sulphuric acid, and urobilin. The increase of the two first-mentioned substances connotes albuminous decomposition in the alimentary canal. The term "pathological urobilin" is so frequently used that it is expedient to point out that the pigment is the same whether it is present in physiological or pathological quantities. An easy method to extract the pigment from the urine in which it is abundantly present is

to shake a portion with amylic alcohol in a separation filter. The solution is then treated with a concentrated ammoniacal alcoholic solution of zinc chloride, when the fluid becomes fluorescent and shows the characteristic absorption band between the lines B and F. Although the presumption is that the excess of urobilin arises in pernicious anæmia, from increased blood destruction, an alternative possibility is that there is increased formation from hydrobilirubin in the intestine.

The peculiar dark brown colour of the urine in pernicious anæmia has been ascribed to an excess of urobilin. This statement is made in all the current text-books I have examined, although the error has been pointed out by Garrod and Hopkins. When the urobilin is extracted from the urine the latter still retains its peculiar tint. As the urine darkens on standing the colour may depend on the formation of an oxidation product of skatoxyl sulphuric acid, but a more likely explanation is that it is due to an undetermined derivative of hæmoglobin. On microscopical examination of the urinary sediment degenerated cells were seen—probably renal—containing yellow pigmented granules as described by Hunter, and the results, as a whole, may be said to corroborate some of his observations.

Reverting to the theories of causation mentioned at the outset, the question whether, as maintained by Hunter, there is a normal disintegration of red corpuscles in the portal area is one of great interest. So far as the liver is concerned Stockman meets the proposition with an unqualified denial. In my opinion Hunter is in the right; but it is necessary to recognise that the arguments advanced by him are not convincing, and I should accord the liver precedence over the spleen in relation to the hæmolytic function. I have been engaged during the last winter in experiments upon the liver kept alive by perfusion after death of the animal, and these prove unquestionably that the organ possesses a marked hæmolytic power. This power, moreover, appears to be exerted only upon a certain number of the corpuscles—namely, those that have become weakened and are poor in hæmoglobin. These experiments will be published in detail shortly. Whether the spleen, portal blood, or leucocytes play any part in the destruction of effete red cells must be still regarded as an open question. Whatever the function of the spleen may be, its extirpation in certain cases without death goes to prove that it is not essential to the maintenance of the normal nutrition of the body under ordinary circumstances. Stockman, in explaining Minkowski's observation, is, I think, under a misapprehension in supposing that the capillary blood-current is slower in the liver than elsewhere.

Taking into consideration the enormous diminution in the red cells, with, as a rule, a striking rise in the colour index and increased deposit of iron in the outer zones of the liver lobules, and the absence of hæmoglobinuria, it appears an inevitable inference that pernicious anæmia is due to increased blood destruction taking place in the portal area. The fact that the conjugated sulphates are increased in pernicious anæmia and that the administration of chloralbacid has no effect upon the amount eliminated indicates the usual cause of increase is not at work in this affection. The putrefactive proteid destruction is therefore occurring in some other area, possibly in the intestinal mucosa itself or in one of its glandular offshoots. The absence of any effect from the use of chloralbacid is further evidence of the divergence existing between this and other forms of anæmia.

The all-important question is the cause of the hæmolysis. Is it due to a toxin produced by a special micro-organism, to an excess of some substance having a physiological origin, or to a new, and therefore essentially pathological, metabolic product? The area of its production appears to be within the portal system, for there is no hæmoglobinuria and therefore no free hæmoglobin in the general circulation. In brief, the facts are at present too scanty to justify a definition of the actual cause of the hæmolysis, yet sufficient to suggest the inadvisability of restricting attention to the discovery of a purely hypothetical microbic agent.

Harrogate.

PERSONATING A SANITARY INSPECTOR.—The Swansea bench of magistrates on August 27th issued a warrant for the apprehension of a man who, it was alleged, had been passing himself off as a sanitary inspector. It was stated that the man wore a badge on his cap and boarded ships, obtaining money from the masters on false pretences.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

THE USE OF CUPROL IN GRANULAR OPHTHALMIA.

BY SIMEON SNELL, F.R.C.S. EDIN.,
OPHTHALMIC SURGEON, ROYAL INFIRMARY, AND PROFESSOR OF OPHTHALMOLOGY, UNIVERSITY COLLEGE, SHEFFIELD.

THE number of remedies proposed and used at one time or another for the treatment of granular ophthalmia is multitudinous. The old-fashioned "blue stone" nevertheless still occupies a prominent place among the more reliable local applications and the benefit in many cases from its use is unquestioned. Recently in some cases I have substituted for the copper sulphate a new chemical compound of copper called cuprol. It is a form of copper in combination with nucleinic acid and is said to contain 6 per cent. of copper. It is claimed for it that it penetrates the tissues more deeply and is much less irritating to inflamed surfaces than the ordinary copper salts. It does not coagulate albumin nor is it precipitated by alkalies and it is readily soluble in warm water. I have employed cuprol in several cases of trachoma. Many have been more or less chronic but a few have been more acute. In some also there has been pannus. Cuprol is supplied in the form of a fine impalpable powder and the application has been made by freely dusting the powder on the inner surfaces of the lids which were everted for the purpose. A convenient way is to take the powder up with a camel-hair brush and to dust it on the eyelids or to spread it about with the brush. The powder is so impalpable that it does not immediately irritate and the discomfort occasioned afterwards is very slight compared to that caused by the application of "blue stone." A lady, a sister of mercy, long accustomed to having "blue stone" applied to her granular lids, is very decided in her preference for the cuprol in consequence of the less discomfort it causes. Others have made the same statement. The patients at the infirmary have testified to this in a practical manner by quickly departing after the application, whereas if copper sulphate had been employed they would have wanted to wait about until the effects of it had somewhat subsided and this even when cocaine had been used. With cuprol the use of cocaine has not appeared to be necessary. The applications of cuprol have, in some cases, been made daily; in others, twice a week or less frequently. In the interval, a 5 per cent. solution of cuprol has, in a few cases, been prescribed to be dropped into the eye. Up to the present the use of cuprol as an alternative to other remedies is distinctly encouraging. I propose to use it in solution in other conjunctival affections.

Sheffield.

NOTE ON A CASE OF TETANUS SUCCESSFULLY TREATED BY ANTI-TETANIC SERUM.

BY E. MANSEL SYMPSON, M.A., M.D., B.C. CANTAB., M.R.C.S. ENG.,
SURGEON TO THE LINCOLN COUNTY HOSPITAL.

A MAN, aged 45 years, who was sent to the Lincoln County Hospital by Mr. Oswald Giles of Sleaford, was placed under my care on April 12th, 1901. Fourteen days before his admission to the hospital he had been kicked in the back by a bull and in falling forwards had knocked his nose on a piece of rusty iron which gave it a nasty ragged cut. On April 9th he noticed that his jaws were stiff and that his throat hurt slightly on swallowing. On admission he was found to have a scar on the bridge of his nose which was not quite healed and was discharging pus. His breath was very offensive and his teeth were in a very bad state. His jaw was stiff and could not be opened wide. He had a great deal of hair on his face and the moustache and whiskers quite veiled any risus sardonicus, but it was noted that the outer half of the occipito-frontalis was much contracted, leading to wrinkling above the eyebrow and around the outer and upper edge of the orbit on

both sides of the forehead. His temperature was slightly raised. Twenty grains of potassium bromide with 15 grains of chloral hydrate were given every night, which was followed up on the 13th by a mixture containing 10 grains of potassium bromide three times a day. On that day the abdomen and limbs were somewhat rigid. On the 14th, as the hardness of the abdomen (it felt exactly as though the chest was continued down to the pubes) and the stiffness of the limbs and jaw had increased, 10 cubic centimetres of anti-tetanic serum were injected. On the 15th, 16th, 18th, and 19th the same amount was injected. On the 20th the patient was much better; he could move his jaw more easily and the rigidity of the abdomen and the limbs was very much less. These symptoms gradually passed off. On the 26th his temperature had risen to over 100° F.; he had a sore-throat and pain in his legs and feet which were considerably swollen. He had suffered occasionally from rheumatism, so he was given a mixture containing salicylate of soda, bicarbonate of potash, and sal volatile. His temperature (nightly) fluctuated from 102° to 102·6°, 103°, and 102° again. On May 11th he began to take five grains of salicylate of quinine every four hours and the temperature at once became normal and remained so till he went out on May 31st, when the pain in his lower limbs had vanished and the swelling had almost gone. His mouth had been carefully attended to also.

The effect of the injections of anti-tetanic serum in this case was well-marked and very satisfactory. Probably the serum had nothing to do with the pain and swelling of the legs and feet.

Lincoln.

INTERMITTENT PULSE UNDER CHLOROFORM.

BY RAJABALI RAMJI LAKHDHIR, L.R.C.P., L.R.C.S. EDIN.

THE patient was a Hindu boy, about 12 years of age, suffering from sinuses just below the mastoid process on the left side, from which serous fluid exuded in pearly drops. This stained the boy's clothing and was a source of great discomfort to him. An operation having been resolved on, a preliminary examination was made by myself and by my friend, Dr. B. S. Paikar, who administered the chloroform, the result being that the patient's heart was found to be acting strongly and the sounds were normal. Nothing abnormal with reference to the circulatory system was noticed. Whilst chloroform was being administered he had struggled a good deal. When fully under its influence his pulse was distinctly felt to beat according to a well-marked intermittent type, the cycle being that after every fourth beat there was a pause, followed by four beats and a pause, and so on. After the operation was over, and as the patient was coming round from the anæsthesia, his heart sounds and pulse were very carefully watched. The heart sounds were normal and there was not the slightest trace of intermittency in the pulse. Since that time the patient has been kept under observation, but he has never shown any sign of intermittent pulse.

I have recorded this case on account of this intermittent pulse under chloroform being an exceptional occurrence. The explanation of this phenomenon may be of interest.

Bombay.

ACUTE HYDROCEPHALUS WITH EFFUSION THROUGH THE OCCIPITO-PARIETAL SUTURES.

BY EDWARD J. BRADY, L.R.C.P. IREL.,
FORMERLY ASSISTANT MASTER, COOMBE HOSPITAL, DUBLIN.

THE mother of the patient was a primipara who was delivered instrumentally at term after a rather tedious labour, owing to inertia uteri. The presentation was vertex right occipito-anterior. A caput succedaneum formed on the child's head and axis-traction forceps were used. Chloroform was given and delivery was effected without much trouble. The fœtus was moribund and required artificial methods to bring on respiration. The mother and child did well, but six days later I suddenly received the message, "Child ill." There was a trained nurse in charge. On my arrival it was reported that the child had "twitchings," but no fit, and I accordingly ordered the usual treatment. At a later visit on the same day I found two tumours, right and left, in the line of the occipito-parietal suture rather larger than a partridge's egg; the one on the left side was much lower (nearer to the ear) than that on the right side. There was no pulsation, but pressure on one tumour caused increased tension in the other. The child had had three or four marked convulsions, but at no stage of the case had it suffered from either diarrhœa or constipation. The digestive functions were almost unaffected; there was no vomiting or abnormality of temperature.

The case seems to have been one of acute inflammation of the arachnoid with effusion. It is known that the arachnoid, like the pleura, is a closed sac, and in the healthy state there is just sufficient fluid secreted to allow its surfaces to glide without friction one over the other. Here, I will not say from what cause, an excess of fluid was secreted, and in this infant only a few days old with the occipito-parietal sutures unossified it bulged out to form the tumours herein noted. The treatment consisted in careful dieting, the application of ice, and the administration of bromide of potassium. The diet consisted of sterilised milk given frequently and in small quantities, as the child was unable to take the breast. The child made a good recovery.

That the symptoms were due to the pressure caused by impaction of the fœtal head against the maternal pelvic bones seems unreasonable for the "pains" were weak and the caput succedaneum which had formed was probably caused by simple congestion without any compression. Who has not met with large tense capita succedanea in labour complicated by a narrow maternal pelvis and strong bearing-down pains, without the fœtus, whether delivered naturally or instrumentally, ever exhibiting symptoms as described above? "Pressure of the forceps" some might be tempted to say. That will not in this particular instance bear investigation, because from the application of the instruments until delivery was effected three minutes did not elapse and there were no marks of the blades on the child's head. The family history, both paternal and maternal, is unimpeachable. The recovery was, in my opinion, due to absorption of the effused fluid and to its elimination by the skin, bladder, and rectum.

Barlestown

A Mirror
OF
HOSPITAL PRACTICE,
BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv., Proœmium.

LONDON TEMPERANCE HOSPITAL.

A CASE OF MASTOID SUPPURATION; CEREBRAL ABSCESS; TREPHINING; EVACUATION OF PUS; NECROSIS; SEQUESTRECTOMY; RECOVERY.

(Under the care of Dr. W. J. COLLINS.)

FOR the successful treatment of intracranial suppuration early evacuation of the pus is necessary, but the diagnosis of this condition is frequently very difficult. In the following case the tenderness over the mastoid process, with the discharge from the ears, the presence of optic neuritis, and the mental condition were sufficient to indicate the existence of an intracranial complication, a meningitis or an abscess, with great probability in favour of an abscess. For the notes of the case we are indebted to Mr. J. S. Hosford, jun., surgical registrar.

A youth, aged 17 years, was admitted into the London Temperance Hospital on June 6th, 1900. There was some history of lung disease and insanity in the family. The patient had been healthy except for some discharge from the ears which had followed measles and whooping-cough about 10 years previously. When admitted he was very drowsy and stupid but was able to walk and to feed himself. There was offensive discharge from both ears and the left mastoid was tender to percussion. Both tympanic membranes were destroyed and he was deaf; the left optic disc was

choked. The temperature varied between 101° and 102° F., and during the next few days the drowsiness and hebetude increased. On June 28th, under chloroform and ether, Dr. Collins raised the skin over the left mastoid with an oval flap, and after stripping the periosteum applied a trephine three-quarters of an inch above and behind the auditory meatus. Some fœtid pus was encountered in sawing the bone, and an abscess containing several drachms of pus was opened beneath the presenting dura mater. The cavity, the walls of which pulsated, was irrigated with sterilised warm water and a drain was inserted. The change in the mental condition of the patient after recovering from the effects of the anæsthetic was very marked. The next day, instead of lying listless and drowsy, he was sitting up looking at a paper; cerebration was slow but perfect. Five days later a small collection of pus over the mastoid (superficial) required opening and on August 16th, as pus continued to discharge from the neighbourhood of the trephine hole, the patient was placed under chloroform and ether and a sequestrum of a portion of the parietal bone as large as a penny was removed by Dr. Collins; two drainage-tubes were inserted. Recovery was complete and the patient left the hospital quite well on Sept. 4th.

LEEDS GENERAL INFIRMARY.

A CASE OF PERFORATING GASTRIC ULCER WITH "HOUR-GLASS" CONTRACTION OF THE STOMACH.

(Under the care of Mr. W. H. BROWN.)

IT is customary to look upon a large proportion of the cases of hour-glass constriction of the stomach as congenital, but probably nearly all the examples of this deformity are produced by the contractions resulting from the healing of an ulcer, and the very existence of a congenital variety cannot at present be considered satisfactorily proved. Yet it is worthy of note that in only one or two cases has a gastric ulcer perforated when an hour-glass constriction was present. This is probably to be explained by the fact that this constriction of the organ is mainly produced by the healing of the ulcer; it is therefore not likely to occur in cases in which the ulcer is progressing in depth.

A woman, aged 42 years, was admitted into the Leeds General Infirmary in a condition of semi-consciousness, her previous history being that of chronic dyspepsia culminating in an attack of acute pain at the epigastrium. When Mr. W. H. Brown saw her she was dying, and although the diagnosis was as clear as it ever is in like conditions, to have attempted any surgical interference was out of the question.

Remarks by Mr. BROWN.—At the present time much interest is being manifested in the surgical treatment of gastric ulcer. The above case is, I think, of sufficient importance to be added to the recorded instances of the condition. My colleague, Mr. B. G. A. Moynihan, very kindly undertook the examination of the specimen and his description of the condition of the stomach, together with the illustration from a photograph, will, I am sure, be of interest to all concerned in this rapidly-developing advance in intra-peritoneal surgery.

Report of examination of specimen by Mr. MOYNIHAN.—The specimen is a very beautiful example of hour-glass stomach. The viscus is divided into two nearly equal cavities, communicating by an aperture which just admits the little finger. On the serous surface is seen, opposite the point of narrowing, an oval orifice a quarter of an inch in diameter, with clean-cut edges, leading into the cavity of the stomach. (See figure.) There is some puckering of the surface but no scarring. On the anterior surface were clearly seen, when the specimen was fresh, two crossing bundles of muscular fibres. The bundles are about two-thirds of an inch across and run from the upper side of the cardiac complement to the lower side of the pyloric, and from the upper side of the pyloric to the lower side of the cardiac complement. The fibres in the bundles are most clearly distinguishable at the point of their crossing, becoming gradually lost as they apparently spread out. Similar bundles are seen on the posterior surface though not so clearly. The same puckering is seen on the posterior as on the anterior surface.

The stomach was slit open along the whole length of the greater curvature. The mucous membrane is seen to be gathered up into thick folds radiating on each side to the constriction. There is no cicatrix visible on the mucous surface, but on gripping the wall of the viscus between the isthmus and the lesser curvature a massive thickening is perceptible, and on section this is found to be built up of dense cicatricial tissue around the ulcer which has perforated. The internal opening of the ulcer is oval in shape and measures half an inch by one-third of an inch. The

Hour-glass stomach, with perforating ulcer. The right-hand side of the illustration is the upper edge of the stomach.

edges are thickened and undermined, but more deeply they approach one another, so that the outer opening of the ulcer is only one half the size of the inner. The ulcer's depth is not less than half an inch.

A perforating ulcer in an hour-glass stomach has been once previously described by Siewer.[1] The crossing bundles of muscular fibres were first mentioned by Mariotti.[2] They were described in detail by Saake.[3] To them have been attributed the assumption by the stomach of the hour-glass form, their contraction being, it is suggested, capable of causing the narrowing at the point of their decussation. The presence of the bundles has been taken as evidence that the "hour-glass" form is "congenital." The hour-glass shape of the stomach in this case is clearly the result of cicatricial contraction occurring in and around a chronic ulcer, and the crossing muscular bundles are doubtless brought into prominence by the puckering, as they follow accurately the lines of puckering seen on both surfaces. They are therefore the result and not the cause of the deformity of the stomach.

GOVERNMENT CIVIL HOSPITAL, HONG-KONG.

A CASE OF CALCULOUS PYONEPHROSIS WITHOUT FEVER OR PAIN; DEATH.

(Under the care of Mr. J. BELL, Acting Principal Civil Medical Officer.)

THE absence of signs referable to the kidney in the following case certainly seems to be remarkable. It is

[1] Berliner Klinische Wochenschrift, 1899.
[2] Rivista Clinica di Bologna, 1874.
[3] Virchow's Archiv, vol. cxxxiv.

probable that the suppurative process was of long standing. A bacteriological examination of the pus might have been of interest.

A German, aged 56 years, was admitted into the Government Civil Hospital, Hong-Kong, on Dec. 21st, 1900. The patient looked ill and seemed to be much older than the age which he gave. He stated that he had been suffering from dysentery in Manilla and had come over to recruit his health. His stools were liquid and fairly bile-stained, and throughout he suffered from diarrhœa which was quite unaffected by any treatment. His blood showed no evidence of malaria, his heart and lungs were normal, and the spleen was not increased in size; the liver dulness was small. He complained of no pain anywhere throughout his illness. The temperature varied between 96° and 98·4° F. The urine was examined frequently, but was always normal until the last occasion (five days before death), when the report stated that there was a faint trace of albumin. He slowly became more and more drowsy, sleeping all day and night, but he was easily roused in order to take his food and medicine. Early in the case the mucous membrane of the mouth and lips was constantly covered with thrush. His motions were passed in bed and towards the end he became delirious and very irritable. The case, which was seen by several medical men, was looked upon as one of auto-intoxication, the absorption probably taking place from an old dysenteric ulcer. The treatment consisted of stimulants, liquid diet, and various antiseptics. He died on Feb. 17th.

Necropsy.—At the post-mortem examination it was found that the heart and lungs were normal. The liver was cirrhosed; the spleen was normal. The intestines were much atrophied, but there were no signs of any dysenteric ulcer. The right kidney was enlarged and lobulated, weighing nine ounces—the left kidney weighed 10 ounces. There was a small stone completely blocking the ureter; the pelvis was dilated and full of pus, the abscess cavity extending into the substance of the kidney.

Remarks by Mr. BELL.—As such cases as the above seem to be rare it has been thought worth while to place this one on record. There was never any sign or symptom calling attention to the grave condition of the kidney. The patient looked about 70 years old, though he persisted that his age was only 56 years, and there was a strong alcoholic history. Presuming the history of dysentery to have been correct the diagnosis in an old broken-down constitution seemed to meet the case.

Reviews and Notices of Books.

Diseases of the Stomach. By JOHN C. HEMMETER, M.D. Second edition, enlarged and revised. London: Henry Kimpton. 1901. Pp. 900. Illustrated. Price 30s.

THE favour with which Professor Hemmeter's work on diseases of the stomach has been received by the medical profession has within a few years from the time of its publication necessitated the issue of a second edition, and the author has taken this early opportunity of revising the greater portion of the text and adding a considerable number of new articles on those branches of gastric therapeutics and pathology which have in the interim chiefly engaged the attention of investigators. The book may therefore be regarded as a new one. Among the more important additions may be included those on Hypertrophic Stenosis of the Pylorus, on Enteroptosis, and on the Use and Abuse of Rest and Exercise in the Treatment of Digestive Diseases.

As in the former edition, considerable space is devoted to the description of the most recent improvements in the technique of the methods employed in the physical examination of the stomach and intestines and in the chemical examination of their contents, both normal and abnormal. Within the brief interval which has elapsed since the publication of the first edition certain improvements have been introduced into these methods of diagnosis, and several of them are due to the inventive genius of Professor Hemmeter. The author's methods for testing gastric peristalsis and the locating and capacity of the stomach, and for the intubation of the duodenum, have vindicated their claims for inclusion among useful methods in differential diagnosis. As regards the value of gastro-diaphany as an aid to diagnosis, while admitting its applicability under certain conditions, the author warns us that too much reliance must not be placed in its powers for determining with accuracy the normal and abnormal topography of the stomach without confirmation by other methods of examination. With reference to gastroscopy we are reminded that all parts of the interior stomach cannot be inspected by this means of examination, as, for instance, certain areas of the greater curvature and those portions of the walls which are in the immediate neighbourhood of the cardia. Neither can this method be employed in the case of all individuals. Distension of the stomach by carbonic acid gas, according to the plan of Riegel and Boas, is, in the opinion of the author, a useful method for palpating and percussing this organ, as also for determining the exact position of tumours connected with it or in its immediate neighbourhood. If a tumour can be recognised beforehand it is of importance to notice whether or no its relative position undergoes alteration during the process of distension and in which direction any deviation may occur. The chemical examination of the contents of the stomach, duodenum, and colon, after test-meals or without, are methods of diagnosis to which Professor Hemmeter attaches the very greatest importance. As one of the pioneers of these ultra-refined methods of laboratory diagnosis and as one of the largest contributors to our armamentarium of instruments of research, Professor Hemmeter may well be forgiven for detaining us with many pages of technical detail. The troubles of digestion are no doubt matters of the most serious importance alike to medical man and to patient, but in the vast majority of cases as presented to the general practitioner they are recognisable by the ordinary methods of bedside diagnosis. These bedside methods have been relegated by Professor Hemmeter to a position of obscurity which they hardly deserve. It is not every patient who cares to submit his stomach to the tender mercies of an inflated rubber bag or its contents to the inquisitorial examination of the analytical chemist.

A very valuable chapter deals exclusively with the subject of Enteroptosis, its Etiology, Pathology, Symptomatology, and Treatment. The views of Dr. Joseph Rosengarth constitute a sound basis for approaching this subject on the side of pathology and etiology. According to these views enteroptosis is to be regarded as a pathological reversion to an embryonic state—congenital enteroptosis as the persistance of the fœtal disposition of the abdominal viscera, and the acquired form as the gradual reversion under appropriate conditions of environment to the disposition which is normal to the fœtus. Although not mentioned in this connexion the interesting researches of Marfan on the greatly increased length of the intestines, and consequently of their mesenteric attachments, in certain pathological conditions might well have been included in the lucid account of the ptosis of viscera.

Dealing with the method of subcutaneous feeding in cases in which alimentation by the mouth or bowel is inapplicable Professor Hemmeter speaks favourably of the interstitial injection of olive oil, but he is doubtful whether in its general applications subcutaneous feeding will ever supplant normal feeding. With regard to the intravenous injection of nutritive material we are somewhat doubtful whether the author is justified in making the following statement: "There seems no physiological reason why intravenous or even intra-arterial feeding should not be practised in emergencies." The difficulty of freeing peptones and other predigested foods from toxalbumoses is one reason why the procedure of intravascular injections is at times somewhat hazardous, although this danger does not apply to the injection of sterile defibrinated blood or plasma substitutes which the

author suggests. It is interesting to notice that the no-breakfast plan of Dr. Dewey is mentioned with approval and that Professor Hemmeter has himself become a convert to the two meals per day principle. He regards the rest which is thus afforded to the stomach "as a valuable means of enabling it to do much better work and of leading to a keen hunger otherwise unknown." It is curious that the author should on page 44 have fallen into the same error which we also notice in another recent and important work on dietetics. In both of these instances it is claimed that a person taking in his daily allowance of food more than a certain fixed and arbitrary number of heat units (calories) per kilogramme of body-weight, will put on a corresponding increment in weight and *vice versâ* will lose in weight if he partake of a smaller number. This pseudo-scientific and arm-chair method for reducing the proportions of the obese and for lending plumpness to those who are lean takes no account of the personal index of metabolism in the individual, is wrong in principle, and inapplicable in practice. On the authority of Bouchard it is possible for certain individuals to gain in weight on a diet no more stimulating and nutritious than atmospheric air alone, a paradoxical result which apparently can only be explained on the hypothesis that fat becomes converted into glycogen with fixation of oxygen and thus increases in weight. On one other point we would venture to disagree with Professor Hemmeter. We cannot help believing that this learned, exhaustive, and profoundly technical tome of nearly 1000 pages will be of more value to the specialist and to the consulting physician than to the average general practitioner.

Diseases of the Thyroid Gland. Part I., *Myxœdema and Cretinism.* By GEORGE R. MURRAY, M.A., M.D. Cantab., F.R.C.P. Lond., Heath Professor of Comparative Pathology in the University of Durham, Physician to the Royal Infirmary, Newcastle. London: H. K. Lewis. 1900. Pp. 112. Price 7*s.* 6*d.*

IN this work the author describes the results of the observations which have been made during the last few years on the functions of the thyroid gland and their relation to the symptoms, pathology, and treatment of the diseases to which it is liable. Dr. Murray has found it convenient to divide the subject into two parts, so that in this volume the structure and functions of the thyroid gland are considered, together with the two diseases, myxœdema and cretinism, which are due to loss of those functions. We are informed in the preface that goitre, exophthalmic goitre, and other thyroidal diseases will be described later in the second part. Naturally the author has incorporated most of the matter of the Goulstonian Lectures delivered by him at the Royal College of Physicians of London in 1899.

At one time the thyroid gland, Dr. Murray points out, was considered to be an excretory rather than a secretory gland and the excretion to be a mucinoid substance, the retention of which led to an accumulation of mucin in the body and the production of the subcutaneous swelling in myxœdema. Further investigation has shown that the colloid substance is a true secretion which does not contain mucin. From the observations of several investigators it is evident that the secretion is a complex body, but it is at present difficult to say whether its remarkable properties depend on one or, as is more probable, on several constituents. Dr. Murray then proceeds to show the effects of loss of the secretion of the thyroid gland in animals, and points out the difficulties that first arose owing to the different results obtained by various observers until it was shown that removal of the parathyroid glands along with the thyroid gland produced different effects from the removal of the thyroid alone. The double operation was followed by acute symptoms, the removal of the thyroid alone produced no such immediate effects.

A thoroughly good account is given by Dr. Murray of myxœdema, its history, etiology, symptoms, course, termination, pathology, diagnosis, prognosis, and treatment. The description of the symptoms and clinical course of the disease is one of the best that we have encountered. It is pointed out that in the experimental myxœdema of the lower animals nervous symptoms are very prominent, but that some of them are probably due to the loss of the parathyroids rather than to the absence of the thyroid gland alone. In the myxœdema resulting from a slowly-developing thyroidal fibrosis the nervous symptoms are less acute and take a secondary position in many cases to the general symptoms; but the main characteristic is a general slowness in execution of all functions of the nervous symptoms.

The author is exceptionally qualified to speak on the treatment of myxœdema as he was the first to suggest thyroid extract as a remedy for that disease. This method of treatment has now been generally adopted and with the greatest success. Dr. Murray gives a brief account of the first case he treated with the extract in 1891, and at the time of writing this book he states that the patient still remains free from myxœdema. The details of the treatment are clearly described, and attention is drawn to the fact that the administration of thyroid extract is diagnostic as well as curative should the case be one of myxœdema. The remarks on cretinism are also well worthy of perusal. The two volumes when complete will prove a valuable addition to the literature on diseases of the thyroid gland, and consequently the publication of the second volume will be awaited with much interest.

Obstetrics: A Manual for Students and Practitioners. By DAVID JAMES EVANS, M.D. Series edited by BERN B. GAULLAUDET, M.D. Illustrated with 149 Engravings. London: Henry Kimpton. 1901. Pp. 430. Price 7*s.* 6*d.* net.

THIS book is one of Kimpton's Series of Modern Text-books by American Authors, edited by Dr. Bern B. Gaullaudet. The present volume is intended as a pocket text-book of obstetrics, and it is a condensed account of the more important facts of this branch of medicine, the various standard text-books having been largely drawn upon by the author in its compilation. Detailed criticism of such a book is hardly called for. The author appears on the whole to have done his work well and the result is a fair specimen of the smaller text-book, a class of work which we are not much in the habit of recommending to students. Dr. Evans puts forward the theory that the essential exciting cause of the nausea and vomiting of pregnancy is the physiological uterine contractions. It is these contractions, excited to an unusual degree by the presence of blood charged with effete materials in the dilated blood sinuses of the uterine wall, which precipitate the paroxysms of nausea and vomiting. It is probable that the occurrence of the nausea in the morning is due to the engorgement of the pelvic circulation consequent upon the change of posture. This engorgement leads to excessive uterine contraction and thus the peripheral irritation is increased. Under the treatment of concealed accidental hæmorrhage no mention is made of the plan now adopted at the Rotunda Hospital, Dublin, of plugging the vagina so long as the membranes are unruptured. The treatment of this important and dangerous condition is but briefly considered and no suggestion is made for the very fatal class of case where the uterus fails to respond to any stimulus and where the best plan of procedure is very difficult to determine. Dr. Evans does not agree with the advice of most authors to perform bipolar podalic version in cases of placenta prævia. As he points out, in many such cases the operation is impossible and in the end internal version has to be performed, a conclusion which agrees with our own experience. The best section in the book and the

most complete is that upon the Anomalies and Diseases of the Nipples and Breasts. The chief objection brought forward against symphysiotomy is one which we do not remember to have seen laid much stress on before and that is the great dislocation of internal organs which accompanies forcible extraction, with the result that the patient suffers from prolapse of the uterus and weakness of the pelvic floor.

The index is fair and the illustrations, most of them very old friends, are sufficient.

LIBRARY TABLE.

Thérapeutique Chirurgicale et Chirurgie Journalière (Surgical Treatment). Par G. PHOCAS, Professeur Agrégé à la Faculté de Lille. Avec 108 figures dans le texte. Paris: Vigot Frères. 1901. Pp. 650. Prix 8f.—This is a useful little manual, forming one of a series on the several branches of medicine. It does not include the diseases of the eyes, nose, ears, larynx, or mouth—these are to be found in a separate volume of the series—but it does contain gynæcological surgery. The descriptions have been necessarily abridged so as to keep down the size of the volume, yet it cannot be said that there has been any real sacrifice of efficiency. The operations described are mainly those more usually adopted, and it is only here and there that we find some novel procedure introduced. One instance of this is the description of a new method invented by the author for amputation of the thigh. At the commencement of the operation, before any of the flaps are cut, the bone is laid bare on its outer aspect by a longitudinal incision, and it is then divided by an osteotome; the flaps are subsequently formed, the large vessels being divided last. The author speaks highly of the method, and it is certainly very ingenious. The account of antisepsis and asepsis is especially good, but all the book is satisfactory. Diagrams are freely introduced and they are more than 100 in number. We do not know any better work of its size.

An Atlas of the Anatomy and Physiology of the Child. With explanatory text by D'ARCY POWER, M.B. Oxon., F.R.C.S. Eng. London: Baillière, Tindall, and Cox. Pp. 23 and plates. Price 3*s.*—This is one of those atlases for teaching anatomy by means of superimposed plates. Such plates may give the learner an idea of the relative positions of the various organs, but we fail to see where the physiology mentioned in the title comes in. The circulation of the blood, the respiration or the action of, say, the kidneys secreting cannot be represented in a picture except possibly by a biograph. Mr. Power's text is, of course, clearly written and gives a simple account of anatomy and of physiological processes, but as regards the "Atlas" part of the book we think it of little use.

Preaching and Healing. The Report of the C.M.S. Medical Mission Auxiliary for 1900-1901. London: Church Missionary House, 1901.—This report is a record of medical mission work in most countries of the world, reports being sent in from places so far apart as British Columbia and Egypt. Few medical details of the operations carried on are given, but the society's helpers are evidently in earnest.

Lessons on Massage. By MARGARET D. PALMER. London: Baillière, Tindall, and Cox. 1901. Pp. xiv.–234. Price 7*s.* 6*d.*—Miss Palmer is the manager of the massage department of the London Hospital and instructor of massage to the nursing staff of that institution, so that this book is written by one who knows about what she is writing. Of course, as we have often said before in reviewing treatises of this description, no one can learn massage entirely from a book, but after the principles have been acquired by ocular and manual instruction a book dealing with the matter is useful. Miss Palmer commences by giving a history of massage, a discussion upon the use of lubricants (which as a rule are best dispensed with) and then passes on to give definitions and classifications of the various movements employed. Anatomical details follow and then the various regions of the body are considered with the appropriate massage for each. The two concluding chapters are both very good and deal with the Weir-Mitchell treatment and massage for children respectively. A useful and clearly written book.

Bacteriology and Surgical Technique for Nurses. By EMILY M. A. STONEY. London and Philadelphia: W. B. Saunders and Co. 1900. Pp. 190 and index. Price 5*s.*—Seeing that the date of publication of this book is 1900 we may commence by saying that we only received a copy in August of the present year. Now that antisepsis or rather asepsis, plays such a prominent part in medicine and surgery it is quite right that nurses who have to assist at operations and in the after-care of the patient should have some knowledge of bacteriology, for without such knowledge the precautions which they have to take will appear meaningless. The first part of Miss Stoney's book is taken up with Bacteriology and Antiseptics and the second part with Surgical Technic, which last word we notice is spelled upon the title-page of the London edition as "technique"—doubtless a concession to British prejudice. Miss Stoney's account of bacteriology is simple and clear and she gives a very complete list of antiseptics, though she falls into the common error of saying that Condy's fluid is a solution of permanganate of potassium, which it is not. The preparations for surgical operations are nowadays so elaborate that it is as well to have the details of the technique put down in a book so that they can be referred to, and Miss Stoney's chapters contain every information necessary. We are glad to see that she adds a chapter upon the Conduct of Post-mortem Examinations in a Private House and a very sensible chapter it is.

With the Scottish Yeomanry. By THOMAS F. DEWAR, M.D. Aberd. Arbroath: T. Buncle and Co. 1901. Pp. 198.—Dr. Dewar went out to South Africa as a trooper with the Scottish Yeomanry in February, 1900, but we gather from his book, though he does not definitely say so in so many words, that soon after his arrival he was raised from a trooper to be a medical officer. Anyway, he managed to send home a series of bright, cheery letters to the *Arbroath Journal*, describing his wanderings and those of his comrades up and down the Free State and the Transvaal. He is evidently cut out for a campaigner, for though he grumbles—and divine discontent is a good thing—he was quite ready to take the rough with the smooth. We are glad that these letters have appeared in a more permanent form than the columns of a daily newspaper, for they are well worth reading.

Sister Theresa. By GEORGE MOORE. London: T. Fisher Unwin. 1901. Pp. 236. Price 6*s.*—"Sister Theresa" is the second volume of "Evelyn Innes." The reader of that book may remember that in the closing chapter the heroine was shown as leaving the convent to which she had retired for rest. The book now before us deals with her return to the world, her final return to the convent, and her struggle in the attempt to live the religious life. Mr. Moore's dissection of Evelyn's character is marked by all his characteristic minuteness, and we see very well brought out the study of the mental processes of a passionate, artistic woman. Owen Asher, her lover, is at least a gentleman. He gets Evelyn trained as an opera-singer, is delighted at her success, and is faithful to her, more than she was to him. But the life palls upon her and she again seeks the convent definitely to become a nun. Mr. Moore's description of the convent and its inhabitants is graphic and interesting. Whether it be true or not we are naturally unable to say. Though we hope that for their own sake there are not many Evelyn Inneses, yet there are undoubtedly some. With

the possible exception of the Mother Superior of the convent the book is a record of unhappiness. Even Asher was, according to Evelyn's account of him, "always pursuing pleasures in which he knows there is nothing except disappointment." *Vanitas vanitatum* is the motto of the book.

Analytical Records
FROM
THE LANCET LABORATORY.

CREASOTE EMULSION OF COD-LIVER OIL WITH HYPOPHOSPHITES OF CALCIUM AND SODIUM.

(PARKE, DAVIS AND CO., 111, QUEEN VICTORIA-STREET, LONDON, E.C.)

THIS is a well-prepared emulsion, uniform and permanent. Besides containing three grains of calcium hypophosphite and two grains of sodium hypophosphite per fluid ounce 1 per cent. of beechwood creasote has been added. There is scarcely any suggestion of the taste of cod-liver oil, owing chiefly to the presence of certain aromatics. Creasote also serves to mask the taste of cod-liver oil, although in this instance the creasote is not disagreeably in evidence to taste or smell. The preparation is one of obvious therapeutic usefulness.

CONDENSED MILK ("COW'S HEAD BRAND") SLIGHTLY SWEETENED.

(THE SWISS MILK SOCIETY, LONDON AGENCY, H. GILBERTSON AND SONS, LIMITED, 11, ST. ANDREW-STREET, HOLBORN-CIRCUS, LONDON, E.C.)

We have previously reported upon a sample of condensed milk prepared by the Swiss Milk Society which, unlike the present sample, contained no added sugar. There is no doubt that the addition of sugar to condensed milk is in most cases excessive. On the contrary, when this preparation is diluted to a desirable strength by adding, for example, three parts of water to one part of milk there is hardly any sweet taste of added sugar perceptible. The preparation is quite fluid and does not crystallise. On analysis the following results were obtained: moisture, 60·66 per cent.; mineral matter, 1·98 per cent.; fat, 10 per cent.; non-fats, 27·36 per cent. On adding one part of the milk to three parts of water the following was the composition of the mixture obtained: fat, 2·90 per cent.; sugars, 4·20 per cent.; mineral matter, 0·56 per cent.; casein, 4·16 per cent.; water, 88·18 per cent. The milk was sterile and contained no chemical preservatives. The flavour was good and typical of rich grass milk.

LIQ. HÆMOGLOBIN CO. (VINSIP).

(VITALIA, LIMITED, 5, ALBION-PLACE, BLACKFRIARS, LONDON, S.E.)

The characteristic reactions of hæmoglobin were obtained. The preparation also contained the albuminous principles of blood; it turned solid on heating. The characteristic spectrum absorption lines of hæmoglobin were observed with a diluted solution, the lines being more marked when the liquid was made faintly alkaline with ammonia. The preparation is free from disagreeable taste. In view of these results "vinsip" is a valuable hæmatinic. According to our analysis it is preserved with borax.

CHAMPAGNE (CUVÉE SPECIALE, 1893).

(L. AND R. CARRÉ FILS, AVIZE MARNE (NEAR RHEIMS); LONDON OFFICES, 24, MARK-LANE, LONDON, E.C.)

This wine is grown in the proximity of celebrated vineyards in the Champagne district. It is a wine of a dry pleasing character. The results of analysis are of interest and are as follows: alcohol, by weight 10·15 per cent., by volume 12·58 per cent., equal to proof spirit 22·06 per cent.; sugar, 1·11 per cent.; extractives, 2·31 per cent.; fixed acidity reckoned as tartaric acid, 0·44 per cent.; volatile acidity reckoned as acetic acid, 0·054 per cent.; alcohol in volatile ethers, 0·20 per litre; alcohol in fixed ethers, 0·21 per litre; alcohol in total ethers, 0·41 per litre. As will be seen from these results the wine has only been moderately liqueured. Also it yielded very satisfactory figures in regard to the amount of the peculiar ethers of wine both fixed and volatile. The latter occur in almost the same quantity as in genuine brandy, though of course they are associated with a far less quantity of alcohol, nearly a fifth less. The wine possesses the delicate fragance and taste of high-class champagne. An excellent feature in the analysis is the insignificant amount of volatile acid. The wine may be recommended as sound and palatable and as containing a minimum of sugar.

CASUMEN COCOA, MACARONI, AND CHOCOLATE.

(PRIDEAUX'S PURE CASEIN AND LIFE FOOD CO., LIMITED, MOTCOMBE, DORSET.)

We have already examined and reported upon "casumen," which consists of the pure casein of milk reduced to a fine white soluble powder. This powder may be used for augmenting the nutritive properties of many articles of food. Those before us are examples. Casumen macaroni gave on analysis the following results: moisture, 11·92 per cent.; mineral matter, 0·91 per cent.; proteids, 15·91 per cent.; and carbohydrates, 71·26 per cent. Without the addition of casumen macaroni would possess little or no proteid value. This addition is equal to about 20 per cent. of casumen. The cocoa gave the following results on analysis: moisture, 7·59 per cent.; mineral matter, 4·27 per cent.; fat, 17·00 per cent.; proteid, 45·22 per cent.; cocoa constituents in addition to the foregoing, fibre, &c., 25·92 per cent. According to these results the addition of casein is about 50 per cent. Lastly casumen chocolate contains 15 per cent. of added milk casein. The advantages of this addition are well brought out in the analysis, the preparations each and all presenting the elements of a complete food in rich proportion.

(1) AMBER ALE; (2) NOURISHING STOUT.

(EDWARD ARCHER AND CO., GREAT MALVERN.)

The analysis of the stout gave the following results: extractives, 6·79 per cent.; mineral matter, 0·36 per cent.; alcohol, by weight 6·07 per cent., by volume 7·57 per cent., equal to proof spirit 13·27 per cent.; sugar, 0·93 per cent. This is a good, full-bodied, nourishing stout, free from acidity though ripe. It was in good condition and did not contain an objectionable excess of carbonic acid gas. The ale gave the following results on analysis: extractives, 3·27 per cent.; mineral matter, 0·31 per cent.; alcohol, by weight 5·31 per cent., by volume 6·63 per cent., equal to proof spirit 11·62 per cent.; sugar, 0·51 per cent. This is a good light sound ale of excellent flavour possessing a delicate bitter taste disappearing quickly on the palate as true hop bitter should do. The composition of both beers is all the more satisfactory that in neither case is a chemical preservative employed. Testing for arsenic gave negative results.

VARIOUS SWEETS.

(J. H. JACKSON, CANAL-STREET, NOTTINGHAM.)

Our analytical notes of these preparations are as follows: (1) they contain some glucose; (2) no reaction whatever was obtained for arsenic; (3) other injurious metals were absent; and (4) the colourings were of an innocent character.

CANADIAN CLUB WHISKY.

(HIRAM WALKER AND SONS, CANADA; LONDON OFFICES, 13 AND 14, TRINITY-SQUARE, TOWER-HILL, LONDON, E.C.)

The age of this whisky is guaranteed, it is stated, by the fact that the Canadian Government place an Excise certificate over the capsule of every bottle. The capsule of the whisky now being sold to the English public and that of the sample sent to us are marked 1892. This method of control

is excellent. The whisky is said to be matured in barrels the inside of which is burned so as to present a charcoal coating to the spirit, charcoal being credited with mellowing influences. The spirit is dark in colour and resembles brown sherry, a fact which distinguishes it sharply from Scotch, Irish, or other whisky commonly consumed in this country. The flavour is peculiar. It is neither malty nor smoky. On analysis the following results were obtained: alcohol, by weight 41·60 per cent., by volume 49·29 per cent., equal to proof spirit 86·37 per cent.; volatile acidity, calculated as acetic acid, 0·048 per cent.; extractives, 0·12 per cent.; mineral matter, *nil*. In spite of its dark colour the amount of extractive matters, as will be seen, is small. One unsatisfactory feature in our examination was that the whisky responded very distinctly to the test for furfuraldehyde, which some authorities regard as an objectionable constituent.

PHENALGIN (PINK TOP CAPSULES).

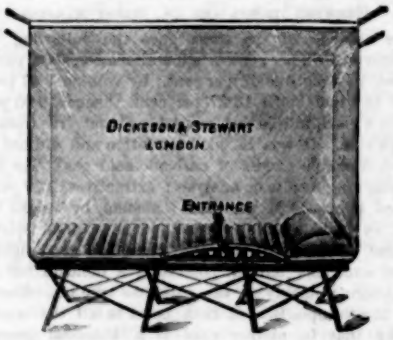
(E. J. REID, 11, DUNEDIN HOUSE, BASINGHALL-AVENUE, LONDON, E.C.)

We have previously referred to this antipyretic and analgesic, consisting of a well-known coal tar derivative in association with carbonate of soda and ammonia. Phenalgin is a white crystalline powder smelling strongly of ammonia. It is very conveniently contained in five grain doses in gelatin capsules, the outer one, by which the inner is closed, being of a pink colour. This method of exhibiting doses is a distinct advantage. It may be deprecated, however, if in any degree it encourages the popular and indiscriminate use of antipyretics of this class.

New Inventions.

TRAVELLER'S MOSQUITO-NET.

THE accompanying illustration represents a traveller's mosquito-net which I have for the past 20 years recommended for use in the tropics. The engraving clearly shows



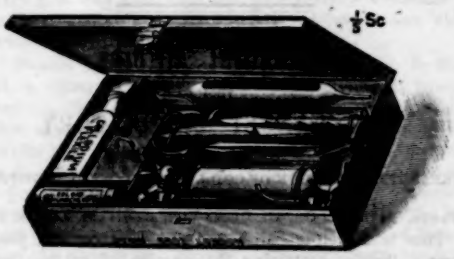
the construction of the net, which is practically an oblong box with a weighted opening through which the traveller enters the net. The chief value of this net is that it compels attention and in practice it is found to ensure protection against mosquitoes.

ROBERT W. FELKIN, M.D. Marburg, F.R.G.S.

Henrietta-street, W.

AN EMERGENCY CASE.

MESSRS. DOWN BROS. have made for me the case figured below and a leather satchel by which it may be carried by hand or on a bicycle. The case is furnished with instruments to treat internal hæmorrhage by the subcutaneous injection of saline gelatin solution and also for the intravenous injection of normal saline solution. The distinctive features of the case are that it contains an hermetically sealed tube of sterilised gelatin solution and that the syringe is made wholly of metal and all its fittings non-corrodible. All the junctions are made sure by bayonet catches. The dimensions are 9½ inches by 5½ inches by 1¾ inches and the weight is 3¼ pounds. Beyond its special service in hæmorrhage the syringe is useful as an aspirator for exploration and the other instruments are such as are required for the



treatment of simple wounds and minor surgery. The contents of the case are as follows:—(1) Syringe with metal plunger, platino-iridium needle, and silver vein canula; (2) scissors, dissecting forceps, scalpel, and aneurysm needle; (3) metal compartment for needles and chromic gut; (4) collodium flexile; (5) soloids of sodium chloride (Burroughs, Wellcome and Co.); and (6) an hermetically sealed tube of saline gelatin solution to make five ounces for injection as one dose, put up by Mr. William Martindale of Wimpole-street, W., at my prescription.

GEO. WM. DAVIS, M.D., B.S. Durh., L.R.C.P. Lond.,
Sidcup, Kent. M.R.C.S. Eng.

LITERARY INTELLIGENCE.—The following new books and new editions are announced for early publication by Messrs. J. and A. Churchill. "A Manual of Anatomy," by the late Alfred W. Hughes, Professor of Anatomy at King's College, edited by Arthur Keith, Hunterian Professor at the Royal College of Surgeons of England. The book is designed for use in the dissecting-room. "Clinical Essays and Lectures," by Mr. Howard Marsh, surgeon to St. Bartholomew's Hospital. A work on Gynæcological Pathology, by Dr. Charles Hubert Roberts of Queen Charlotte's and the Samaritan Hospitals. The feature of this book will be the number and excellence of the illustrations. "The Bacteriological Examination of Water," by Major Horrocks of the Army Medical School, Netley. "Serum-therapy," by Dr. R. T. Hewlett, Professor of Hygiene at King's College. "A Text-book of Clinical Medicine," by Dr. T. D. Savill. "A Handbook of Nursing, Medical and Surgical," by Dr. W. J. Hadley, physician to the London Hospital. "Elementary Ophthalmic Optics, including Ophthalmoscopy and Retinoscopy," by Dr. J. Herbert Parsons, of the Royal London Ophthalmic Hospital. Vol. IV. of Groves and Thorp's "Chemical Technology: Electric Lighting and Photometry," by Mr. W. J. Dibdin and Mr. G. E. Cooke. The sixth edition of "A Manual of the Practice of Medicine," by Dr. Frederick Taylor, physician to, and Lecturer on Medicine at, Guy's Hospital. The fourth edition of Vol. I. of "A Text-book of Medicine," edited by Dr. Pye-Smith, physician to Guy's Hospital. The ninth edition of "Chemistry: Inorganic and Organic," by John Millar Thomson, Professor of Chemistry in King's College, and Arthur Bloxam. The fifth edition of "A Short Manual for Monthly Nurses," by Dr. Cullingworth, obstetric physician to St. Thomas's Hospital. The third edition of "A Simple Method of Water Analysis," by Dr. John C. Thresh, medical officer of health of Essex. The second edition of "Dissection Outlines for Use with Morris's Treatise on Anatomy."—Professor Karl Pearson of University College, London, has prepared a revised edition of his "Ethics of Freethought," which discusses the problems of the day, Religion, Labour, and Sex. The aim of the book is to contrast the emotional and rationalistic treatments of philosophical and social problems; to show how the enthusiasm of the study is a real factor of human development, and how the slow and gradual educational work of the thinker is after all more permanent than the emotional influence of the market-place. It will be published by Messrs. Adam and Charles Black.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 14, 1901.

The Student and the Royal Army Medical Corps.

FEW matters of interest to the medical profession, and especially to the medical student, have been more written about recently than the work and position of the Royal Army Medical Corps. Not one of the popular books on the war that may be likened to mushrooms on the field of the South African campaign failed to give a chapter or more concerning the corps; while the serious works on the campaign as well as the letters of medical men at the front have dealt with its deeds in copious detail. Explanations of, and remedies for, the deficiencies which observant writers have noticed in official medical work at the front have been forthcoming, while deeply ignorant persons have rushed to the rescue with impossible remedies for non-existent conditions. From every side, in fact—from those qualified to speak as well as from those in whose case silence would have been the more precious metal—there has been offered a rich harvest of suggestions for reviving the drooping condition of the Royal Army Medical Corps. And testimony to the devotion and skill of individual members of the corps has been as emphatic as any of the criticism lavished upon the faults of the system; but it is a human trait that, just as it is easier to find faults than to discover a man's good points, so condemnation produces more effect and lingers in the memory more persistently than the kinder words. Thus it has come about that at the present time probably a young medical man will regard the Royal Army Medical Corps as a service which offers no inducements to him to join it. Indeed, if the student believes only a fraction of what has recently been written on the subject he must look upon the members of the corps as fit objects of pity. Nor can it be denied that even before the war it was in many quarters the habit to think lightly of military medical service and to dissuade young medical men of particular promise from entering the ranks of the corps. This was, of course, a very unfortunate circumstance for the corps, even though the advice was sincere and to some extent well grounded. But we believe that such a view can be shown to be unjust to the service, and unwise from the point of view of the young man who is to make his living by the profession of medicine. The Royal Army Medical Corps offers great opportunities too little regarded, and there is almost certainly a prospect of imminent improvement in several directions. It is most undesirable that there should be among the younger members of the profession anything like a boycott of a service which has added to the roll of the great men of medicine some of its most revered and honourable names. We are not belittling the grievances of the service or denying the necessity of thorough reform; but we desire to point out that the position is not the hopeless one that the pessimist would have us believe, and that prudent parents and far-seeing students will do well not to dismiss from their minds all idea of serving their country and their profession in the Royal Army Medical Corps.

In considering the advantages and disadvantages of a career in the military medical service it is, to begin with, of importance that a man should not allow the obvious and much-harped-upon drawbacks of fixed regulations—the red-tape bugbear—to hide from him the fact that medical service in the army offers certain unique opportunities. The sphere of activity of the medical man attached to the British army is world-wide. In no other service in the world, not even in that of our navy, is there an equal chance of studying the diseases peculiar to particular lands and particular districts of those lands in practically every known portion of the globe. The imagination and the professional interest must be dull indeed if they are not some time or another quickened into interest by a consideration of the varied field in which an officer of the Royal Army Medical Corps finds himself. It is said that the red tape, of whose restricting bonds so much is talked, fetters original scientific work wherever performed; but this we imagine to be only partially correct, while the system under which it prevails has, we may confidently hope, seen its day. We believe that the time is not distant when the officers of the Royal Army Medical Corps will be encouraged to take the deepest professional interest in their work. In many a tropical district or up-country station the service need have no ties but those which depend upon the medical officer himself. He is placed in a position for observation, experiment, and reflection which many a fellow-student, cramped in the bustling business of a town practice, can but dream of and vainly sigh for. The early interests of natural science, the fields into which he did but peep at the beginning of his medical studies, lie open and free at his feet. All around him is Nature with her endless suggestions of study, and her constant allurement towards fresh effort to gather from the vast unknown, even if it be but a fragment, towards the useful accumulation of decided facts. It is a common objection to accepting a commission in the Royal Army Medical Corps that a man forgets his medical knowledge and the practice of his profession. To some extent this must be so; and when an officer has decided that to remain in the service for any length of time is to waste his life in a career of thankless and ill-paid routine it is an additional hardship that during his period of service he can learn but little that equips him for civil practice. It is not fair, however, to charge this too loudly against the Royal Army Medical Corps, the regulations of which can hardly be expected to take a shape agreeable to the desires of those whose interest it is to leave the service as soon as it is convenient to them to do so. It is a serious defect in the present working of the corps that so little opportunity is provided for the officers to keep themselves abreast of modern medical knowledge; but the pity of this lies in the fact that their use to the service is thus impaired, not in the fact that they receive a bad

training for private practice. The ordinary roads of practice may often be closed to the officer of the Royal Army Medical Corps, but in their stead he is placed in boundless fields of inquiry, confronted with vast questions of climatology, epidemiology, hygiene, and sanitation that may never stir the energy or test the knowledge of the civil practitioner. To a man whose mind is open to life as a whole, who feels the longing to see something more of the world than one or two towns or country districts in his native land, who has an instinctive love of adventure and a thirst for ethnological information, there could be no comparison between the attractions of civil practice and those of the Royal Army Medical Corps, if the organisation of the corps allowed advantage to be taken of the fair promises which it offers. So far we have spoken only of the career of the officer of the Royal Army Medical Corps in times of peace, in times when his enemies are plague and cholera, malaria and fever. We have said nothing of his duties on active service. Yet to the man who finds practical surgery an attractive side of the medical profession the chances of getting his fill of surgery near the field of battle will loom large as an incentive towards military practice. And of service in the English army almost alone of European armies can this be said. We have, fortunately, not always in hand such an opportunity for the exercise of operative skill as has been offered by the war in South Africa; but it is seldom indeed that somewhere or another in or on the borders of our colonies and possessions there is not fighting in progress; and there, sure enough, will be found the medical officer reaping perhaps in a week experience that could be spread over the lifetime of a civilian brother. Again, what scope actual service in the field gives the medical officer for putting into practice his acquaintance with hospital management and the treatment of enteric fever in the bulk! How necessary it is for him to display tact as well as learning, firmness as well as kindness, resourcefulness and a sense of responsibility as well as obedience and accuracy! A branch of the medical profession where opportunities are offered for displaying such qualities is not one to be lightly passed over, without consideration, as possessing nothing to recommend it.

If we consider the matter from another point of view, the practical one of a medical career as a livelihood, we shall probably recognise the fact that many a man who chooses civil practice comes to believe that he would have preferred a life in one of the services. At the outset the young practitioner thinks little, because he knows little, of the risks, anxieties, hard work, and many disappointments of private practice. He is dazzled by great examples which alone offer themselves for his admiration. The unsuccessful are not ostentatious, and practice as he sees it represents prosperity. He compares the position and the income of flourishing members of the medical profession with the scant pay and slow progress of the officer in the Royal Army Medical Corps. The comparative freedom from worry, the limitation of competition, the assured life and future pension in the service do not enter his mind: he thinks he can do so much better elsewhere and enjoy a liberty which he cannot expect to have as an officer in the army. Later, when the many disillusions of private practice crowd on him, he wonders why he brushed aside with hardly a thought the idea of competing for a commission in the Royal Army Medical Corps. We have stated the matter more or less from a civilian point of view, our intention being not so much to defend the Royal Army Medical Corps from criticism as to impress upon the student that he must not be led away by hasty advice to give no consideration whatever to the promises of good work and advancement that are held out by the service. The grievances of the members of the Royal Army Medical Corps are many, and the attempts to meet them have, so far, been unfortunate. We do not detail these grievances at any length or discuss their comparative importance, for this has been done over and over again in our own columns and in those of our medical and lay contemporaries. It is sufficient to say that it is admitted on all hands that the present system has had a sufficient trial and that in spite of many attempts to amend it it has yielded unsatisfactory results. The members of the corps feel that they are and have been treated with scant consideration by the War Office, their chances of achieving a first place in the exhilarating race of intellectual progress being small, their pay and their leave inadequate, and their position not well defined. Now there is nothing here that cannot be remedied. The service has been a fine service in the past and there is no reason whatever, of course, why it should not become a fine service in the future. Everything depends upon the immediate recognition, by the powers in authority, that reform in many directions is necessary; for just as it is unreasonable of the student to make up his mind off-hand that he will have nothing whatever to do with the Royal Army Medical Corps, so it is unreasonable of the Government to expect that they can obtain picked young medical men without offering them adequate salaries and proper chances of advancement commensurate in some degree to the value of their medical work. The report of the Commission at present sitting on Mr. BRODRICK'S scheme for the reform of the Royal Army Medical Corps is on the eve of being made public. We have reason to believe that the terms offered to the corps under this scheme will be found to be liberal, and that the desires of the profession will be met by conferring advantages on those who display professional zeal and ability. If this should be so a fine field is open for the medical student which has of recent years not been available.

The Royal Commission on Tuberculosis.

THE Government has responded with commendable promptitude to the unanimous desire of the British Congress on Tuberculosis and has appointed a Royal Commission with full powers to investigate the comparative phenomena of tuberculosis in man and animals. It is seldom that the recording cylinder of time measures a Government reflex act with so short a latent period. This recognition of the importance of the issues raised by the explosion of what Professor HUEPPE calls "ROBERT KOCH'S bombshell" is a result calculated to meet with the entire approval of the medical profession and one which well illustrates the weight which can attach to a name and to the opinion of

one bacteriologist *contra mundum*. It is well that the cloud of dust which has arisen in consequence of this explosion should be dissipated as quickly as possible by the authoritative pronouncement and weight of a Royal Commission.

The constitution of the Commission which has been appointed for the purpose of setting at rest the public anxiety is such as to guarantee that everything that experience, energy, and scientific knowledge can provide will be brought to bear in the elucidation of many of the obscure points which complicate the problems of tuberculosis. Sir MICHAEL FOSTER with his unrivalled and encyclopædic knowledge and with his matured judgment is in himself a tower of strength, while Dr. SIDNEY MARTIN and Professor SIMS WOODHEAD, as representing the clinical and laboratory aspects of the inquiry, may be depended upon to gauge the value of all the practical operations involved in an experimental inquiry. Professor MCFADYEAN will add to their knowledge his special acquaintance with bovine tuberculosis. In Professor RUBERT BOYCE, the remaining member of the Commission, we have a happy combination of business capacity with technical laboratory knowledge; his inclusion in the Commission is a guarantee that the inquiry will be conducted on business lines. And the country may well be anxious on this point, for the delay which detracted from the value of the Commission of 1890 was very serious. It will be remembered that it was not until the year 1896, six years subsequent to the appointment of the Commission of 1890, that we had an opportunity of publishing in the columns of THE LANCET the report of the experimental researches carried out under the orders of the Commissioners. From that time forward the fullest confidence has been imposed in the suggestions embodied in the report of that Commission; it has, in fact, been regarded as representing the standard of executive control. Now Professor KOCH has introduced a serious element of uncertainty into our commonly accepted conclusions, and in the public interest it is necessary that all doubt should be allayed as speedily as possible.

The terms of the present Commission are clearly designed to prove or to disprove the truth of Professor KOCH'S independent assertion and run as follows:—1. Is the disease in animals and man one and the same? 2. Can animals and man be reciprocally infected with it? 3. Under what conditions, if at all, does the transmission of the disease from animals to man take place, and what are the circumstances favourable to such transmission? A truly comprehensive series of replies may incidentally supply answers to several of the pathological difficulties which beset the correct understanding of the conditions which determine the infectivity of disease in general. For instance, it would be of practical importance if we knew the difference between a natural infection and an experimentally inoculated disease. In both instances, under presumably favourable conditions for infection, the margin of failure is notoriously wide. It is possibly associated with the degree of natural resistance or relative immunity exercised by the host towards the invading parasite. Perhaps the degree of resistance may be connected with the particular breed of the animal, with its food, or with its hygienic surroundings. Again, it would be of importance to possess more accurate information on the limits of morphological and physiological variations possessed by the tubercle bacillus. What is its natural distribution and what are its relationships, if any, with certain other organisms of closely allied morphological structure? The Commission has been instituted to set at rest the doubts aroused by Professor KOCH, but the main value of the work of such an inquiry often lies in its by-products, and no doubt some at least of these urgent questions will receive full attention. An answer to any one of them will fully justify the institution of this Government inquiry.

The Attempted Assassination of President McKinley.

ONCE again have overweening vanity and a weak mind open to evil influence been the means of setting in motion the assassin's weapon. The attack upon the President of the United States has not even the shadow of excuse which similar attacks upon an hereditary monarch may possibly be said to have. Like the President of the great European Republic, the President of the United States is elected by the popular vote and only holds office for a certain period of time. But the act of CZOLGOSZ is even more fatuous and irrational than that of CESARIO SANTO, the murderer of the President of the French Republic. M. CARNOT had with absolute wisdom and discretion refused to interfere with the death sentence passed upon VAILLANT, RAVACHOL, and HENRI, and had therefore drawn upon himself the bitter hatred of the "brotherhood" to which these scoundrels belonged. No such special reason for destroying President MCKINLEY existed. With rare exceptions, such as that of the Chicago anarchists, the sect whose policy and creed is murder have lost no member by the arm of American law, and for the fate of those to whom the law had meted out punishment Mr. MCKINLEY was in no way responsible. He was shot simply and solely because he represented government, even though as a popularly elected ruler he represented also the will of the majority. ALEXANDER of Russia, the type of the absolute monarch, was done to death for the same reason. King HUMBERT of Italy and the Empress of AUSTRIA fell victims to the same blind lust for blood and hatred of anything like rule.

CZOLGOSZ, like all of his kidney, boasts that he is an anarchist and also maintains that he has no accomplices. In one sense he may have none, but in fact his accomplices are many. To say nothing of the woman whose ravings he confessed had set his brain on fire, every preacher and propagandist of what is miscalled liberty—the right of every man to do as he likes—is an accomplice of the man whose hand levels the pistol, guides the dagger, or throws the bomb. CZOLGOSZ was at first said to be a lunatic and this judgment may well be passed upon the author of a crime so meaningless. The death of President CARNOT made no difference whatever in the government of France, neither would the death of President MCKINLEY make any difference in the government of the United States. In a republic a new president is elected to succeed the previous one whether he be removed by resignation or by death, and, moreover, he is elected by the will of the people—by that will to which anarchists appeal as being the only source of

rule. The sole consolation which the viperous brood of anarchists have upon an occasion such as the present is that their crime sets the various Governments of the civilised world in a ferment as to how to check the pest. The crimes of anarchy are so futile, so stupid, and withal so easy to carry out, that their terror consists in the impossibility of foreseeing when they will happen. Any complacency that the anarchistic leaders may feel in the trouble that they have created will, we hope, be removed by drastic concerted measures against them. The United States will lead the way with peculiar satisfaction, and the European nations may be trusted to assist.

America and England have long been known as the two countries where a man undergoes no disabilities for his political opinions, and we do not think that either country is likely to change in this respect. But anarchy is not a political opinion—its preachers, teachers, and active members are simply and solely pests of society and should be remorselessly harried, even as a pack of rabid wolves would be. The whole of Europe and of the various countries of the two Americas will be searching for a remedy for the state of things that makes anarchy possible. We do not deny that in some cases anarchy is bred of poverty and oppression, or that a portion of the remedy for crime is to be found in improving the social condition of workers of every class. But in the meantime the assassins, whether they are the actual perpetrators or the instigators of murder, must be taught that punishment swift and terrible awaits them. It is impossible to legislate for the removal of motive in an apparently motiveless crime, and where an assassin is willing to lay down his life to accomplish a crime it is well-nigh impossible to prevent him carrying his design into execution. Whether an attack be successful or not, death, and that carried out in private after a private trial, should inevitably follow. The insensate vanity of the anarchist's mind revels in the glorification of a public execution and the world-wide reports of his trial, and these gratifications should be taken away from him. But the head and front of the evil is the propagandist, the man of culture and education who scatters his glib vapourings about property and the rights of man broadcast by means of the press. Authors and publishers of incendiary and seditious prints should be punished as severely and in as uninteresting a manner as possible; for though it be the educated brain which conceives inflammatory articles, and the hand which has never done an honest day's work which writes them, yet the miserable beings who translate these theories into acts are the poor who are bred in misery and nurtured in hopelessness. Their own misery, and what they can do or cannot do, assume a disproportionate importance in their eyes, and in the vapourings of anarchist writers they see revelations of a Utopia. The remedy is to shut off the stream of violent ideas at the fountain-head.

PAIGNTON (DEVON) COTTAGE HOSPITAL.—The garden fête recently held in aid of the funds of this hospital was a decided success. After the payment of £112 as expenses there remained a sum of £241 which has been handed over to the institution.

Annotations.

"Ne quid nimis."

THE CONDITION OF PRESIDENT McKINLEY.

WE have received the following cable from Dr. M. D. Mann, who, it will be remembered, was the actual operator in the laparotomy performed upon Mr. McKinley. It is dated Sept. 10th and worded as follows:—

"President's condition eminently satisfactory. Barring unexpected complications convalescence is assured."

Everyone in these islands will, we are sure, rejoice at the news which tells us that the United States are delivered from the calamity of losing their elected ruler. The dangers in gunshot wounds of the abdomen may be set down as shock, hæmorrhage, and septic peritonitis. From the two first the President may at this juncture be considered quite safe. The injury which the bullet inflicted was to perforate both walls of the stomach. As, however, that viscus was practically empty at the time of perforation, and as a laparotomy, together with localisation and repair of the perforations, were performed within a very short time after the infliction of the injury, the danger of peritonitis was reduced to a minimum. Although it cannot be definitely asserted until a later date that this complication will not arise, yet it may be confidently expected that it will not. The records of the Spanish-American war, and of our present struggle in South Africa, show that the danger of perforating gunshot wounds of the abdomen is far less to-day than it was some years ago, and although a revolver makes a larger and more lacerated wound than a small-calibre rifle, yet the prompt manner in which the wound was treated gives every hope for expecting a favourable result. President McKinley's life has, under Providence, been saved by the excellent surgery of our American *confrères*, while the ministrations of Dr. Mann, Dr. Parmenter, Dr. Mynter, and the other well-known medical men associated with the care of the case were enormously assisted by the fact that in the grounds of the exhibition there was a perfectly equipped emergency hospital. This was a hospital for use and not for show, and, as a result, within a few minutes of the atrocious outrage the President was receiving every possible assistance that modern surgery could devise.

THE FEEDING OF INFANTS.

IT is not surprising that at the present time, a season in which more than in any other infantile enteritis with diarrhœa is apt to be prevalent, the question of milk-supply and milk dieting in infancy should have come into prominence. At the last meeting of the British Medical Association at Cheltenham Dr. George Reid, medical officer of health of Staffordshire, added his contribution to this subject in a paper on infant mortality in relation to the employment of married women in factories, in which he insisted on the necessity of a milk diet for infants to the exclusion of substitute foods. It is to be remembered that even milk itself when artificially reconstructed in a laboratory, desiccated, and then prepared with water as a food has proved to be insufficient for nutritive purposes and that its use is liable to be followed by scurvy and other signs of tissue starvation. Nor do we consider that the addition of a fresh food substance to this imperfect diet can be relied upon to obviate the evils which it entails. Experience has shown that the employment of such substitutes for fresh milk, however chemically correct, can at best only serve a temporary purpose. Natural milk must remain the true diet of infancy

and there is a limit to the extent to which it may be interfered with. In a leading article in THE LANCET of August 24th we noted the fact that simple boiling or heating to the degree required for sterilisation does not appear to influence the nutritive value of milk. We referred to the value of this practice as a safeguard against bacterial contamination. It is necessary, however, to remember that this part of the question, and, indeed, the whole subject of nutrition, has a domestic as well as a physiological side. The infective process which results in enteritis arises in all probability as often from want of care at home as from a faulty milk-supply. Mothers and nurses, it is true, are now much more alive to the need of scrupulous cleanliness in regard to everything that relates to the feeding of infants than they were even a few years ago. Trouble still arises nevertheless and cases of dysenteric diarrhœa, if less common and less frequently fatal than formerly, are far from unusual. Its prevention ought not to be a very difficult matter. But the medical man must remember that no instruction to mothers and nurses can be too elementary. The commonest lessons of cleanliness must be taught, and all the influence of the practitioner will be required, particularly among factory hands and the poorest classes, to ensure attention to the teaching.

SELF-HELP.

AT Sandgate recently there was opened a new convalescent home. The lines upon which this and the parent institution at St. Margaret's Bay, Dover, are being run are such as would have rejoiced the heart of the late Dr. Samuel Smiles. Eighteen years ago it occurred to a few working men, who were endowed with a more than usual share of administrative capacity and desire to benefit their fellows, and who were already connected with the Hospital Saturday Fund, that a home run by a committee of working men, and supported principally by small weekly subscriptions collected amongst themselves, would become popular with craftsmen generally. The result greatly exceeded their expectations. Substantial aid was, however, rendered in the early days by the late Mr. Samuel Morley, after whom the home at St. Margaret's Bay was named "Morley House." A liberal supporter was also found in the late Sir Alfred Bevan and the building just opened at Sandgate bears the name of the "Bevan Memorial Home." Patronised by His Majesty the King, with the Earl of Aberdeen as president, and with a voluntary committee of men drawn from various trades who are elected annually by their fellow mechanics, the supporters of the institution are assured that any money subscribed is expended to the best advantage. The committee visit the home at intervals of three weeks and inspect every detail, making a tour of the building throughout. In the evening an hour or two is spent in the recreation-room with the inmates. Criticism on the conduct of the home is invited and any suggestions for its improvement are discussed. A liberal dietary is provided, and the food, though plain, is good. The inmates are not hampered with a number of irritating rules, the idea being to permit as much individual freedom as possible. It speaks well for the working of the system that out of 12,000 patients who have passed through "Morley House" only one case of misconduct and drunkenness has been brought to the notice of the committee. The new home is for the reception of either male or female patients, adult or juvenile, who are considered eligible by the committee. A number of medical men act as honorary examining officers, and every patient has also to be passed by the medical officer to the Home. For a year or more until the last few months the new Home has been used as an auxiliary hospital for wounded soldiers returned from South Africa. Some of our readers may be glad to know of the existence of this home on behalf of their humbler patients, though, indeed, there is no lack of applicants for admission. The purchase of the building and the alterations necessary to fit it for the requirements of the institution have cost between £16,000 and £17,000, and the charitably disposed could not well bestow their help upon a more deserving object.

ON PATHOLOGICAL DREAMING.

PROFESSOR A. PICK of Prague contributes an interesting article on Pathological Dreaming to the July number of the *Journal of Mental Science*. Students of psychological medicine have long recognised the similarity which dreams bear to the delusions of the insane or the waking delirium of the opium-eater. Dreams may have a pathological significance in certain neuropathic conditions. For example, the dreams of chronic alcoholism are continued into waking life, thereby influencing conduct, and in certain forms of hysteria and erotomania day-dreams of a voluptuous nature may occur occasionally which are hardly distinguishable from reality by the patient. For the peculiar perversion of the mental state attending the latter condition Havelock Ellis has lately proposed the name "auto-erotism." Both Pierre Janet and Näcke state that some degree of cerebral exhaustion underlies the tendency to abnormal forms of reverie and day-dreaming, and the latter refers to quite definite conditions, such as the fatigue of balls and weddings, as among the causative agencies. Professor Pick records three interesting cases, the clinical and mental symptoms of which he gives at some length. Case 1 was that of a man, aged 43 years, a goldsmith. During the 10 years of his married life his wife had noticed that the patient often during the day and night spoke to himself, sometimes softly and sometimes loudly, and as though he imagined himself to be among his fellow-workmen, at the town council, or before the deputy mayor. "If spoken to he ceased at once, but gave no explanation, except once when he said that *various thoughts came to him against his will, which he had to speak out although he knew that it was all untrue.*" Latterly this condition had grown worse, following upon certain obscure "seizures"—tremblings of the limbs and noddings of the head, attended by loss of consciousness—frequently witnessed by his wife. The patient had been since a child of a suspicious nature, readily deluding himself with the idea that people wished to poison him. In the other class of seizures before described, where he gesticulated and talked with himself, he retained a certain confused consciousness and memory of what was happening, and on being questioned he would state that he was experiencing a sort of dreaming and dream-acting which sometimes felt so real that he could not distinguish it from actuality. His physical state showed nothing special and the nervous system presented no clearly hysterical stigmata. His condition improved a little under treatment and regular work, so that the night-dreaming disappeared and that by day became less frequent. Case 2 was that of a law student, aged 23 years, who complained of suffering from "phantasies" and an excessive proneness to reveries and dream-pictures of masturbation from his eighth to his eighteenth year. Latterly he developed the idea that people were unfriendly and disdainful to him and sometimes experienced suicidal promptings. On one occasion he fancied that he was present at a duel, but the sensation was so vivid that he "seemed really to see the people who were present." Optical impressions played the chief part in the dreamings, but he also heard "voices." He had various physical indications of neurasthenia and degeneracy. Case 3 was that of a clerk, aged 18 years, who had manifested peculiar aberrations of conduct in the form of petty embezzling and theft, loose living and fastness, and a tendency to fantastic lying (pseudologia

fantastica). He showed physical symptoms of hysteria, such as a diminution of the corneal and cutaneous reflexes and irregular areas of complete analgesia on both sides of the body. Mentally he was ill-balanced and pretended while a boy to be an anarchist for a time. His waking reveries or dreams were sometimes so real that he could not distinguish them from actual facts. He thus told a story of a duel which on inquiry turned out to be unreal. The dreams were associated with what he read and heard or with songs. Professor Pick concludes that there are many transitional states from the vivid play of fancy to the delirious dreaming states of the hysteric.

"THE NEW POOR-LAW INFIRMARY AT HALIFAX."

As we announced in our issue of August 31st the Halifax Board of Guardians, at a meeting held on August 21st, rejected by 20 votes to 3 a proposal of Father Russell that Dr. T. M. Dolan should be appointed medical officer of the Halifax Union Poor-law Hospital at Salterhebble at a salary of 100 guineas per annum. We now learn that a representative meeting of medical men of Halifax and district was held on August 28th to consider the action of the board of guardians. Dr. E. West Symes, J.P., was in the chair and the following motion was carried:—

> That this meeting of medical men express their sympathy with Dr. Dolan in not having been appointed medical superintendent to the Halifax Poor-law Union Hospital.

We have not at present heard of any appointment having been made to any one of the medical officers' posts at the new infirmary and, in our opinion, the board of guardians have placed themselves in a difficult position.

THE WATER-SUPPLY OF JERUSALEM.

THE *Times* recently contained a very interesting account of the water-supply of Jerusalem. From this we learn that the annual mean rainfall of the district is 30 inches and that during the last year there has been a great drought, the amount of rainfall having been less than the usual amount to the extent of one-half. The city is usually supplied almost entirely by rain-water which is collected on the terraces of the houses and stored in cisterns hewn in the rock and situated beneath them. Even in ordinary years the amount collected and stored in this way is insufficient to supply the wants of the inhabitants and a year of drought causes great distress. During the present summer the municipal authorities made arrangements by which a certain amount of water was brought by railway in skins and sold at a fixed sum to the poor. The new Governor of Jerusalem, Mahomed Djevad Pasha, set himself to see what could be done permanently to improve the disastrous condition of affairs which he found on his arrival. Fortunately it happened that Franghia Effendi, one of the Sultan's engineers, was present in the city at the time and he suggested that a pipe should be laid to convey water from Ain Salah, a place situated about nine miles to the south of Jerusalem. This work, he estimated, would not cost more than £5000, could be carried out in a month, and would serve to convey an amount sufficient to fill 8000 skins per diem. There was an old endowment for supplying the city with water, but the funds had been devoted to other purposes. The Governor on telegraphing to the Sultan his congratulations on the festival of the birth of the Prophet begged that the occasion might be celebrated by the imperial permission to appropriate part of the fund to the purpose for which it was originally intended. The Sultan granted the necessary permission, and on July 5th the work was formally commenced. The ceremony must have been a picturesque one. The highest Turkish officials, the civil and military pashas, and the heads of the Mahomedan religion were present. The Governor laid the first stone, lambs were slaughtered, and their flesh was, according to ancient usage, immediately divided among themselves by the poor. The customary prayers also were offered. The source of the water-supply is by no means a new one. For many years the exact site of the hidden spring was not known, but a "sealed fountain" has, it is believed, flowed through a conduit made by Solomon ever since the time at which he built it. The tunnel opened into the north-west corner of the highest of Solomon's Pools, and supplied that reservoir. Solomon is supposed to have referred to this conduit when he compared his beloved to "a garden inclosed ..... a spring shut up, a fountain sealed."[1] However this may be, the structure of the tunnel shows that it is one of great antiquity. In the engineering work which is now projected the line of the new pipe will probably take the course of an aqueduct which formerly conveyed water from the same source to the area now occupied by the Mosque of Omar which was built on the site of the Jewish Temple. The pipe is to be 10 centimetres in diameter and its length will be 20 kilometres. Some long-disused fountains which exist in Jerusalem are to be fitted with taps from which it is proposed that the people shall be allowed to draw the water which they require without payment. The Governor of Jerusalem is to be congratulated on the good work which he has commenced. We hope it may be successfully and quickly carried out.

THE OUTBREAK OF SMALL-POX IN LONDON.

SINCE the middle of July there has been a considerable increase in the number of cases of small-pox that have occurred in London. At a recent meeting of the managers of the Metropolitan Asylum District it was reported that the number of small-pox patients then under treatment on the hospital ships and at the shelters was 96, compared with 26 a fortnight previously. During the past two months the weekly number of admissions of fresh cases for the weeks ended on the dates mentioned have been as follows: July 13th, six admissions; 20th, five; 27th, two; August 3rd, four; 10th, three; 17th, eight; 24th, 30; 31st, 52; and Sept. 6th, 28. The fall during the first week in September is satisfactory. Although the numbers of admissions have not risen to a very alarming total, yet the outbreak is of sufficient magnitude to demand the serious attention of the authorities. The medical officers of health in the affected districts have risen to the occasion in a most praiseworthy manner and there is every reason to hope that a serious epidemic will not be forthcoming. An interesting letter was read at the above meeting from Mr. A. Wynter Blyth, the medical officer of health of Marylebone, suggesting that when the history of the present outbreak of small-pox was compiled its origin would be found intimately connected with errors in medical diagnosis, and more especially with the difficulty in distinguishing a mild case of small-pox modified by previous vaccination from an attack of varicella. This statement is one of the strongest arguments as to the efficacy of vaccination. At one time small-pox was one of the most common of diseases; thanks to the enforcement of vaccination it is now a comparatively rare disease, so that many younger medical practitioners have only seen a very few cases. As Mr. Blyth points out also, the characteristic eruption of the disease is considerably modified by an early vaccination. In many cases of the present outbreak the rash has been very profuse and the vesicles have been by no means characteristic, thus greatly adding to the difficulty of diagnosis. We would strongly urge that vaccination and revaccination should be compulsory in all persons resident in a house where a case

[1] Song of Solomon iv. 12.

of small-pox has occurred. It is only by measures of this kind, and by prompt removal to hospital when home-nursing is undesirable, that the outbreak can be overcome. The medical officers of health will doubtless do all they can in this direction, although they are hampered by existing legislation.

OBSTRUCTION OF WHARTON'S DUCT BY A TOOTHPICK.

IN the August issue of the *Dental Cosmos* Dr. Aguirre narrates a case in which Wharton's duct was obstructed by the fragment of a toothpick. The patient, a young girl, aged 18 years, had complained for a long time of pain in the region of the submaxillary gland. The pain increased during mastication and gradually became so severe that it prevented her from eating. The submaxillary region was found to be swollen, the skin over the gland presenting a deep red colouration. The floor of the mouth was acutely inflamed, the papilla of Wharton's duct projecting about half an inch beyond the level of the surrounding tissues. An examination of the mouth disclosed the presence of a pointed body in the duct which on being removed proved to be a fragment of a toothpick about three-quarters of an inch in length. The toothpick was covered with a calcareous deposit.

THE INSTRUCTION OF DEAF-MUTES IN THE UNITED STATES.

FROM a leaflet recently issued by Dr. Joseph C. Gordon, superintendent of the Illinois Institution for the Education of the Deaf and Dumb, we learn that at the present time there are 10,608 deaf and dumb children under instruction in the United States. Of this number 3921 are dealt with exclusively on what is called the silent system, while 6687 receive instruction under the oral system, about two-thirds of them being taught without recourse to sign language. The first permanent school for the deaf in the United States was opened in 1817, but it was not until 1869 when the oral system began to receive attention that any considerable progress was made in the practical education of deaf-mutes. At the present day two American institutions for the instruction of deaf and dumb children contain each upwards of 500 pupils—the Pennsylvania Institution in Philadelphia and the Illinois Institution. In the first-named school sign-language finds no place whatever, either officially or privately, but in the Illinois Institution it is still permitted out of school, in chapel exercises, in public addresses, and also in the social life of the pupils outside the class-rooms. In the vast majority of schools for the deaf throughout the world restrictions are now placed upon the employment of sign-language for instruction, experience having conclusively established the fact that artificial signs usually prove more of a hindrance than a help in the acquirement of a good common-school education. The deaf themselves are greatly attached to signs as a means of communication, but their educators, as a rule, are not in favour of the method. Formerly American teachers did, it is true, look upon sign-language with approval, and many even regarded it as absolutely necessary, but nowadays no educational authority holds these opinions. The best authorities, those most familiar with sign-language, consider its influence pernicious; while one of its most distinguished apologists is constrained to admit that in a school for the deaf and dumb the use of sign language is a dangerous thing. Dr. Gordon's advocacy of the oral system of instruction for deaf-mutes is strongly supported by the authorities of the Home for Deaf Children in Philadelphia which was founded by Miss Emma Garrett in February, 1892. In the biennial report of this institution for the period ending Sept. 30th, 1900, very convincing evidence is adduced to prove "that if a deaf child is surrounded by uninterrupted influences from birth, which teach it articulate speech and lip-reading through the eye as the hearing child learns to speak through the ear, the deaf child can then be educated with hearing children." Deaf-mutes are received in the Garrett Home where they are kept during the entire twelvemonth, between the ages of two years and eight years, and are given a course of not less than six years' duration from the time of entrance. "With many of our deaf children," says the principal, Miss Mary S. Garrett, "there are long periods in their being trained to talk during which it would seem as though they never could learn, and had it not been that our founder left us the motto, 'Obstacles are things to be overcome,' we might many times have been discouraged." Perseverance in a good cause is, however, generally successful, and the present case is no exception to the rule. Nine children, having finished the course in the home, have since leaving it been attending ordinary schools for hearing children. They have not all gone to the same school, but each to a different school in a different locality. "What has been the result?" inquires Mr. S. Edwin Megargee, the president of the home, in his introductory address: "Every one of these children stands in the front rank of scholarship and has required from the teacher no more attention and no greater privileges than the hearing children, except the one requirement of a location in the schoolroom where the deaf child may see clearly the teacher's face." Such a result is, indeed, well-nigh marvellous and, with Mr. Megargee, everyone interested in the hapless lot of uninstructed deaf-mutes may well exclaim—"Should not the advantages which have been given to the comparatively small number of children whom the home can accommodate be extended to every deaf child?"

RECOVERY AFTER SUTURE OF THE AXILLARY ARTERY.

THE successful suture of wounds of large blood-vessels is among the most brilliant achievements of surgery. A very interesting article relating the particulars of such a case is published in the *New York Medical Record* of July 20th last. The narrator is Dr. A. E. Halstead of Chicago, Professor of Surgery at the Chicago Polyclinic. The case was one of advanced mammary carcinoma. Dr. Halstead had performed an extensive primary operation in May, 1900. About the middle of October a small nodule began to grow at the outer end of the clavicle and called for removal. The tumour was about the size of a walnut, and in the operation for removal a wound of the axillary artery occurred. The growth which had originated in the stump of the pectoral muscle, which was left at the first operation attached to the coracoid process, had become adherent to the surrounding parts, including the axillary artery. Dr. Halstead says: "By means of sharp curved scissors the artery was being freed from its attachment to the tumour when the vessel was cut obliquely through about two-thirds of its circumference. Violent hæmorrhage, of course, immediately followed which was controlled by placing the index finger of the left hand under the artery and pressing it up against the clavicle. The operative field was then sponged dry and the wound of the vessel inspected. At the time of the first operation all the branches of the artery excepting the circumflex had been cut, so that there was practically no chance for collateral circulation being established. ..... The only chance of saving the arm was to suture the artery. Accordingly, while the circulation was controlled by pressure of the left index finger, four interrupted catgut sutures were passed through the two outer coats of the vessel and tied. This effectually closed the wound in the vessel, so that no hæmorrhage followed removal of pressure from the artery. To support these sutures

the perivascular connective tissue was sutured longitudinally with a fine catgut suture. The tumour was then dissected from the vessel and the wound closed in the ordinary way. The radial pulse was immediately restored and was as full as that of the opposite side. The patient made a good recovery from the immediate effects of the operation and had at no time any disturbance of the circulation of the arm. She left the hospital at the end of two weeks. Two months after the operation there was still a radial pulse on the left side of a volume equal to that on the right." We congratulate Dr. Halstead on the successful result of the operation. His paper is made still more valuable by the history it gives of the suture of wounds of large vessels. The first case was under Lambert of Newcastle: this was a successful suture of the carotid artery, and dates back as far as 1762.

A PECULIAR METHOD OF SUICIDE.

THE following account of an extraordinary and, we should think, unprecedented method of committing suicide has been kindly forwarded to us by Mr. C. A. J. Wright, F.R.C.S. Edin., of Leytonstone.

A man, aged 63 years, of intemperate habits, who had previously complained of pains in the head and body, committed suicide on Sept. 2nd by cutting through the back of his neck with a razor in a terribly resolute manner. The police-constable called to the case found the man in a corner of his bedroom, seated on a low trunk, with his head resting against the wall. A blood-stained razor, lying open, was close to him. The body had been removed to the bed before I arrived. An examination of the body and its surroundings revealed nothing suggestive of foul play; on the contrary, the hands afforded strong confirmatory evidence of the wound having been self-inflicted. Examination of the wound showed that three separate attempts had been made. The first incision passed from left to right through skin and fascia without wounding the underlying muscles. Starting from a point one inch below the left mastoid process and half an inch above the level of the transverse processes of the seventh cervical vertebra, it passed in a slightly upward direction to a point a quarter of an inch below and three-quarters of an inch behind the angle of the jaw on the right side, here tailing for a quarter of an inch. The second incision, unlike the first, passed from right to left. It started from a point one inch behind the digastric groove (right side), dividing both skin and fascia for half an inch; then, entering the wound made by the first incision, it cut partially through the trapezii and splenii, becoming superficial at a point a quarter of an inch behind the lobe of the left ear, and tailed for one-eighth of an inch. The third incision started from below the right mastoid process, descended for a quarter of an inch to meet the first incision and then passed from right to left deeply through all structures to the interval between the atlas and the axis. Entering the spinal canal in that interval it opened up the theca vertebralis and slightly wounded the posterior columns of the cord, and having notched the transverse process of the axis (on the left side) became superficial by passing below the lobe of the left ear with a tail carried across the left cheek to the anterior border of the masseter. The whole three incisions were made by the razor while held in the *right* hand—no easy task to accomplish. In the absence of a post-mortem examination it is hard to state the immediate cause of death. As might be anticipated from the regional anatomy of the parts hæmorrhage was but slight and death could not be attributed to loss of blood. The shock caused by the rapid loss of cerebro-spinal fluid is probably a factor of more importance. No dislocation of the vertebræ took place, so that there was no pressure on the cord from this cause.

Mr. Wright says that death could not be attributed to loss of blood. On reading his description of the main wound, however, it would seem likely that the vertebral artery was severed, for surely a cutting instrument which passed from the side between the atlas and the axis deeply enough to open the theca vertebralis and to injure the cord could hardly have avoided dividing this vessel, especially as the weapon was a razor and therefore presumably sharp. As against this theory, there was apparently no visible hæmorrhage. The case is full of interest both from a pathological and a medico-legal point of view. The exact cause of death is a matter of some debate, while undoubtedly the first impression that such a wound would give would be that of murder rather than suicide. We are much obliged to Mr. Wright for his interesting note.

THE JUVENILE FORM OF GENERAL PARALYSIS.

DR. JOSEF A. HIRSCH contributes to a recent issue of the *Wiener Klinische Wochenschrift* (No. 21, 1901) an account of the juvenile form of general paralysis based upon observations at the clinic of Professor Krafft-Ebing of Vienna. After a critical *résumé* details are given of four cases of juvenile general paralysis varying from 16 to 24 years of age, the special importance of which lies in the extremely full records of collateral heredity associated with the patients. Two of the cases are highly instructive and the genealogical and collateral histories are as follows. In Case 1 the patient was a boy, aged 16 years, who showed symptoms of general paralysis. The father died from cerebral hæmorrhage. The mother had cataract and signs of syphilis. She was 11 times pregnant with the following issue: a healthy child in 1875, ditto in 1877, abortion at fourth month in 1878, and abortion at sixth month in 1880. The patient was the fifth offspring, and was born in 1884. The sixth was a full-term child, born in 1886, which only lived for four weeks. The seventh, a full-term child, was born in 1887 and died in the sixth week. The eighth was born in 1888 and died at the third month. The ninth, tenth, and eleventh children, born respectively in 1889, 1891, and 1893, were healthy. It will thus be seen that of the 11 offspring the first two and the last three were healthy, the remaining seven showing the results of syphilis in the form of abortions, deficient vitality, and excessive mortality in the first three months of infancy, and juvenile general paralysis. Case 2 was that of a boy, aged 19 years, who suffered from general paralysis. His grandfather was epileptic. The father had syphilis with lymphadenitis in 1868. By his first marriage this man had three children as follows. The first, in 1872, was an abortion, the second, in 1873, was a still-birth, and the third, in 1874, was a child who developed syphilitic pemphigus lasting for about six weeks. This child died at the age of 26 years from pulmonary phthisis. By his second marriage (1876 to 1892) the man had issue as follows. The first, in 1877, was an abortion in the fifth month; the second, in 1878, was a child still-born in the seventh month of pregnancy. In the following year a similar still-birth occurred. The patient was the fourth and was born in 1881. In 1886 a child was born with syphilitic pemphigus (diagnosed as such by Professor Kaposi) which lasted for six weeks. This child died at the age of 17 years from phthisis. The last child was born in 1892 with syphilitic pemphigus as before. At the age of one and a half years it had paralysis following an attack of pneumonia, and it died at two years of age. Dr. Hirsch concludes that hereditary syphilis is the chief cause of general paralysis in children and adolescents, that the mental symptoms of general paralysis appear at about puberty, and that during the preceding stage of childhood some degree of weakness of intellect is present. He notes that the prodromal stage of general paralysis in juveniles is marked by various attacks of partial paralysis and that at its height the disease is a marked and progressive dementia, and as a rule without hypochondriacal or maniacal disturbance. The duration is long and is marked by symptoms of cerebral irritation such as local paralyses of movements and attacks of mental stupor or obscurations of consciousness, and no remissions occur. The necropsies usually reveal a more or less diffuse

lepto-meningitis with tendencies to undue adhesiveness of the pia mater and to decortication on stripping the pia-arachnoid membrane; a diffuse cerebral gliosis or overgrowth of the fibrous neuroglia cells is often present.

A FATAL STING.

THE folly of neglecting trivial accidents is fortunately seldom emphasised with such severity as it was in a case reported in the lay papers this week under the heading of "Death from Acute Blood-Poisoning." A man while employed in some printing works complained of being stung over the left eye. Although the accident happened in the morning he did not seek medical advice until the following day and he died in the same afternoon. At the inquest it was found that "death was due to acute blood-poisoning, caused by a sting, probably that of a wasp." We have no guide as to what evidence led to the suspicion of a wasp. Unless such evidence is strong the probability is rather in favour of the sting having been delivered by one of those flies, numerous in some localities, which are capable of perforating the epidermis and which are more likely than wasps to be the purveyors of virulent septic material. However, the poison was introduced, and wherever it came from it must obviously have been of a high degree of virulence to have caused death so rapidly. The site of infection, close to the loose tissue of the eyelid, was unfavourable for the patient, and should have led to such medical measures being sought as might have prevented the untoward issue of the case. Strong antiseptics applied early might have controlled, if not counteracted, the poison, and the rapid spread of inflammation in the cellular tissue could most probably have been at least considerably diminished by suitable applications. We are never anxious to encourage people in making a mountain of anxiety out of every molehill of accident, but in such cases as those of a sting it is better to pay a visit to a medical man, though it afterwards turns out to have been unnecessary, than to risk disaster which might be prevented by such a visit.

THE DISTRIBUTION OF PLAGUE.

A TELEGRAM from the Governor of the Cape of Good Hope received at the Colonial Office on Sept. 5th states that for the week ending August 31st the cases of plague in the Cape Peninsula numbered 0. At Port Elizabeth the cases were as follows: coloured persons, 2; Chinamen, 1; natives, 1; total, 4; all other places 0. The deaths from plague were as follows: Cape Peninsula, 0; Port Elizabeth, coloured persons, 1; Chinamen, 1; natives, 1; total, 3; all other places, 0 The area of infection remains unchanged. The cases of plague in persons under Naval and Military control number 1, a native from the remount camp at Port Elizabeth. For the week ending Sept. 7th the report is as follows: Cases of plague in the Cape Peninsula, 1—a European; cases in Port Elizabeth and all other places, 0. The deaths are as follows: Cape Peninsula, 1—a European; Port Elizabeth, 1—a native; all other places, 0. The area of infection remains unchanged and there were no cases in persons under Naval and Military control. As regards the Mauritius, a telegram from the Governor received at the Colonial Office on Sept. 6th states that for the week ending Sept. 5th there had occurred 4 fatal cases of bubonic plague. As regards plague at Hong-Kong, a telegram from the Governor received at the Colonial Office on Sept. 9th states that for the week ending Sept. 7th there were 6 cases of bubonic plague with 6 deaths. As regards Egypt: during the week ending Sept. 1st 7 cases of plague have been reported throughout Egypt, all among natives; of these 5 died. No further cases have occurred at Zagazig since August 9th. 4 cases have been found at Mit Ghamr and 3 cases at Port Said. The attention of the sanitary authorities having been specially directed to Mit Ghamr for some time past, energetic measures were immediately applied on the appearance of the first case there, and little fear is entertained of any serious spread of the disease. The general health of the country is good.

PUBLIC BODIES AND TUBERCULOUS FOODS.

IN a leading article we comment upon the admirable promptitude with which the appointment of a Royal Commission has followed upon Professor Koch's views on the relation of human to bovine tuberculosis. It is equally satisfactory to notice that public bodies are alive to the fact that while such a question is still *sub judice* there is every reason to guard against any remission of that vigilance which has hitherto been strongly held to be desirable. The Local Government Board have issued to the councils of the metropolitan and other boroughs, and of urban and rural districts, a circular setting out the points raised by Professor Koch and at the same time impressing upon the local authorities that "pending the investigations and report of the Royal Commission there should be no relaxation on their part or on that of their officers in the taking of proper measures for dealing with milk from tuberculous cows and with tuberculous meat which may be intended for the food of man. It is, in the opinion of the Board, of much importance that these measures should continue to be taken, and they rely on this being done." Having received representations that the action of local officers in seizing tuberculous meat is not uniform, the Board also state in their circular the conclusions with regard to this matter arrived at by the previous Royal Commission on Tuberculosis, and strongly urge the local bodies to direct their meat inspectors to act in accordance with the principles laid down by that Commission. The danger that Professor Koch's theories might lead to indifference in the matter of tuberculous food-stuffs has induced the medical officer of health of Finsbury to issue a memorandum to the Public Health Committee of the Finsbury borough, in which the arguments for continued care are admirably urged. No doubt other medical officers of health have taken similar action.

MEDICAL STUDENTS AND THE POOR.

IN another column we publish a letter from the Warden of the Bermondsey Settlement in which he refers to the fact that medical students can be accommodated in the Settlement as residents, a fact which will enable them to gain an insight into the social conditions of the poor. We consider that the acquirement of knowledge of this description would be an admirable thing for many medical students. The practice of by far the greater part of medical men, at all events at the beginning, lies very largely among the poor, and for the most part upon leaving the hospital the newly qualified man is perfectly ignorant of the social conditions of the poor, except for the little insight into their life which he has gained by attending a small number of midwifery cases. The consequence is that he often makes, or appears to his patients to make, mistakes in manner or behaviour which act and react disagreeably for both himself and his patient. The really poor are rarely, if ever, rude with that studied insolence which may be seen among the higher classes of society. It is true that if they are attended by the medical officer of a charitable dispensary nothing will at first convince them that he is not paid out of the rates and so is in a way their servant, or, more odious still, that he is in league with the School Board. But when these initial difficulties have been got over the practitioner will find his poor patients wonderfully grateful to him and extraordinarily kind to one another.

The medical man fresh from the hospital is apt to order expensive drugs unnecessarily and to have ideas on the subject of diet which are quite incompatible with a wage of 25*s.* per week and a wife and six children. But if he has had experience of the poor in their own homes, of their difficulties, their limitations, and their sometimes actual heroism, he will be able to sympathise with them and will win a golden name among them. For these reasons we emphasise the opportunity proffered by Mr. Scott Lidgett.

"THE NEW CHIEF MEDICAL OFFICER FOR CAPE COLONY."

With reference to an annotation published in our issue of August 24th (p. 539), under this title, we have received a letter from a relative of Dr. A. J. Gregory in contradiction of the statements made in *Greater Britain* from which we quoted. Our correspondent writes: "Some time ago I received a copy of a newly launched paper called *Greater Britain*. It contained an exceedingly venomous letter signed 'Old Colonist' and dealt with Dr. Gregory's appointment. There are one or two statements contained therein with which I should like to deal particularly. Firstly, then, Dr. Gregory went out to the colony 10 years ago, and not three, as stated by 'Old Colonist.' Secondly, his work on the census was of a medical nature. Dr. Gregory has, indeed, spent the last 10 years in a branch of the Colonial Office, as stated by 'Old Colonist'—namely, the Local Government and Health Branch, which department he himself organised and of which the M.O.H. for the colony is head. Then, again, apart from anything else, he has been assistant M.O.H. for the colony for the past five years, during most of which time he has also been acting for the M.O.H., Dr. G. Turner, who has been largely employed on rinderpest and other special work. I think, therefore, that it must be conceded that there was hardly likely to be a man more 'up to the work,' either here or in the colony than Dr. Gregory. Referring to the latter portions of the letter, it is unnecessary to say that the statement that he was clerk to a brewer's establishment is absolutely untrue." We have also received a copy of the *Cape Times* of June 22nd, 1901, which gives an account of the work in connexion with the public health of the colony which has been performed by Dr. Gregory. From this article it would seem that the choice of Dr. Gregory for the post which he now occupies was a particularly happy one. We are glad to learn that Dr. Gregory has qualifications for his office which do not appear to have received proper prominence in the article which appeared in *Greater Britain*, while he possesses the Diploma of Public Health of the Royal College of Physicians of London and Surgeons of England, although in the current Medical Directory and the recent issues of the South African Medical Directory no mention is made of the fact.

The death is announced on Sept. 7th of Dr. J. L. W. Thudichum. He was of German nationality and graduated M.D. at the University of Giessen in 1851. Having settled in this country he became M.R.C.S. in 1854 and in 1878 was elected a Fellow of the Royal College of Physicians of London. He did much work in pathological and physiological chemistry, and conjointly with Dr. Dupré published in 1871 a treatise dealing with the chemistry, origin, and nature of the various kinds of wine.

The annual dinner of the past and present students of Charing-cross Hospital will be held on Wednesday, Oct. 2nd, at the Hotel Cecil. The chair will be taken by Mr. Charles Gibbs, F.R.C.S. Eng., late senior surgeon to the Langman Hospital, South Africa.

THE SANITARY STATE OF THE CITY OF BOMBAY.

The sanitary condition of the municipality of Bombay has for a long time been in an unsatisfactory condition. Dr. John A. Turner has recently been appointed executive health officer to the city, and we have received the report which he has made for the first quarter of the year 1901. The difficulties of carrying out the duties which Dr. Turner undertook in accepting the office which was offered to him are made evident in his first report, and they have been further emphasised in speeches made at meetings of the Bombay Medical and Physical Society, at the sittings which were devoted to a discussion on a paper read by Dr. Turner on the system of registration of births and deaths and the notification of infectious diseases in Bombay. The general problems of the sanitation of Bombay will perhaps be most conveniently considered as two distinct questions. 1. What are the weak points in the present administration? 2. How will the defects be best remedied?

The Present Sanitary Administration of Bombay.

Dr. Turner has devoted two months to the task of making himself acquainted with the working of the Health Department of the city, and during the time he made a survey of the municipality accompanied by the divisional health officers. He has embodied the results of his observations in a letter to the Municipal Commission, the following being his summary of the principal points to which he directed attention:—(1) the amendment of the Public Health Act of 1888 (Dr. Turner has written a special report on those sections of the Act affecting the public health); (2) provision of by-laws (Dr. Turner has already held a conference with the Commissioner on these and made certain suggestions); (3) the registration of births and deaths; (4) infant mortality; (5) the notification of infectious diseases; (6) the provision of free medical relief; (7) the registration of dairies, cowsheds, and milkshops and inspection of milk-supply; (8) the improvement or the method of water-supply; (9) surface and sub-soil drainage; (10) the relaying of storm-water drains and disconnecting house-drainage therefrom; (11) the drainage of districts at present undrained and house-drainage connexions; (12) the overcrowding of rooms, houses, and factories; (13) the ventilation of houses, streets, drains, and sewers; (14) improvement in the present system of night-soil disposal and scavenging; (15) the control of all infectious diseases and hospitals for infectious diseases; (16) municipal police duties to be extended so that they may assist the Health Department; (17) the provision of camps on open spaces for people ejected from overcrowded houses; (18) the provision of houses for employés of the municipality and of houses for the working-classes; (19) the consideration of the method of disposal of the dead and the provision of open spaces for recreation; and (20) the reorganisation of the Health Department. A programme designed to alter all the things mentioned in the report may, indeed, as Dr. Turner suggests, appear to be ambitious, but, supported by the strength of his convictions, he insists that he will not hesitate to urge these matters until they are brought to a successful issue. This is the spirit in which reforms should be attempted, and we hope that Dr. Turner may have the help of the Municipal Commission and that he may have the health and strength necessary to enable him to carry out the arduous work which he has undertaken.

At the present time there are in Bombay no really reliable data from which statistics can be obtained concerning even such elementary facts as the number of the births and the causes of the deaths which occur in the city. For example, during the first quarter of the year 1901, of 24,068 deaths only 569 certificates were received from qualified medical men (421 from private practitioners and 148 from hospitals). In addition to these 2599 death certificates were received from the hospitals for the treatment of infectious diseases. The remaining deaths were not certified by medical men. In the deaths the causes of which are not certified by qualified men an attempt is made to ascertain the nature of the diseases from which the patients died by means of inquiries made from the relatives of the deceased by cemetery clerks and karkoons at the burial-grounds. It is needless to point out that information obtained in this way

cannot be regarded as reliable. There can therefore be no doubt that an alteration in the present mode of registering the causes of deaths ought as soon as possible to be adopted. The practice in use in Bombay for the registration of births is peculiar. The work is carried out by a number of karkoons who obtain information by inquiring in the various wards of the city and who report any birth of which they hear. These officers are paid at the rate of about 11 rupees per month. Theoretical objections could be urged against this curious method of obtaining the birth-rate and practically it is not found to give encouraging results. During the past year 12,600 births were registered in Bombay. The number of infants under one year of age who died was 13,492. We agree with Dr. Turner in thinking that the system of birth registration requires amendment.

In addition to alterations in the present system of recording births and deaths a third question presses for solution. At the present time the notification of infectious diseases is not efficiently carried out. When we remember that in England this important matter has only quite recently obtained the attention which it deserved, and that with the exception of a single disease the Legislature of this country has only just begun to place on the statute books efficient laws bearing on the subject, it is not a cause for surprise that in Bombay with its diversified population the matter has not yet been successfully dealt with. The difficulties in such a city are undoubtedly great. Dr. Turner considers that it would not be wise or fair to penalise parents for their neglect to notify the existence of infectious diseases in their families, because they would, and sometimes truly, plead ignorance as to the nature of the disease which was in question; he, however, thinks that medical men and anyone practising medicine should be compelled to notify, as they are at present, and he contends that they should be paid at the rate of two rupees for each case notified. The objection entertained by medical men to compulsory notification is not peculiar to Bombay, and it is one on which private practitioners and medical officers of health are never likely to be strictly in accord. Medical men who are in practice object to being placed under an obligation to notify infectious diseases because in many cases the patients are averse to the custom, but this and other difficulties Dr. Turner is sufficiently sanguine to believe he will be able to overcome, and his proposed solutions for them may now be stated.

PROPOSALS FOR THE IMPROVEMENT OF THE SANITARY CONDITION OF BENGAL.

On taking up his duties at Bombay Dr. Turner did wisely in trying to obtain all the information he could from the members of the medical profession who were in practice in the city. He issued a circular asking their opinion on the changes which he proposed to introduce in the sanitary regulations of the city. In answer to 277 letters he received 70 replies, of which six came from European medical men, and from these letters he obtained many valuable hints. A discussion which was held at a meeting of the Bombay Medical and Physical Society afforded also a great deal of useful information—men whose long experience of Bombay gave great weight to the opinions which they expressed pointed out the difficulties which were likely to arise in consequence of any interference with native customs.

Dr. Turner places great reliance in a plan which he has proposed to increase the number of the free public dispensaries. At the present time there are in Bombay 18 private dispensaries. Dr. Turner proposes that the present seven deputy health officers shall be retained and that they shall act as registrars and medical attendants to dispensaries, that each dispensary shall be in charge of a qualified medical man, and that students shall be attached to each establishment. The students are to treat out-patients. The medical man in charge is to act also as district registrar of births and deaths, and he will, moreover, be required to notify every case of infectious disease to the divisional officer and will receive a fee of one rupee for each case notified. Each dispensary is to have also the services of a resident hospital assistant who is to act as sub-registrar. This officer is to be paid at the rate of 50 rupees per month and will have free quarters and offices provided for him. It will be part of his duties to attend patients at their own homes. For the registration of births and deaths karkoons are to be appointed and it will be their duty to make accurate daily reports. The registrars and sub-registrars are to make special inquiries in the case of stillborn children, of children who die under the age of 30 days, and of children who die under the age of one year. In regard to the notification of infectious diseases it is already the duty of every medical man to give notice at once to the divisional officer of health. Forms will be supplied for this purpose and the information required will include the name, age, and sex of the patient, and the disease from which such patient is suffering and a statement as to whether the sufferer will be removed to the hospital. It is insisted that the officers must use every effort to induce the patient to be removed to a hospital or camp. In the case of deaths Dr. Turner proposes that an alteration shall be made in regard to the legal disposal of the dead—namely, "that no dead body can be disposed of without a certificate from a qualified medical man, and that in order to give free medical aid to all persons who cannot afford to pay for it ..... any person can have medical attendance free. In this way there can," Dr. Turner says, "be no excuse for disposing of a dead body without medical assistance."

In the course of the debate at the Bombay Medical and Physical Society Dr. Sorab K. Nariman, who appears to possess an intimate knowledge of the city, said that the people of Bombay were not likely to tolerate an inspection of corpses or delay in the disposal of the dead. He pointed out that as a rule the Hindus and Mahomedans dispose of their dead within a couple of hours after death—a custom which he rightly insisted is highly admirable from a sanitary point of view and one which is especially desirable during the prevalence of epidemics in such a climate as that of Bombay. Dr. Turner's proposal, he contended, would, if carried out, lead to the accumulation of a number of dead bodies at the cemeteries, and for that reason it was a suggestion which he could not commend. Dr. Nariman further contended that the payment which it was proposed should be given to the medical officers was inadequate. He approved of the proposed increase in the number of the dispensaries, but suggested that they ought to be officered by undergraduates of the Bombay University, and maintained that every ward in the city ought to be placed in charge of a separate officer whose duty it would be to make himself thoroughly acquainted with the people under his charge and to give "permits" to the poor to attend the dispensary. In regard to notification fees he suggested that if two or more medical practitioners notified the same case a fee should be paid separately to each. This system might conceivably lead to an expenditure of the municipal funds which might prove less advantageous to the city than it would to the "medicos," as Dr. Nariman calls his colleagues. The chief difficulty which presents itself as an impediment to the correct registration of the cause of death was clearly pointed out by Lieutenant-Colonel H. P. Dimmock, I.M.S. A majority of the natives obtain medical treatment from vaids and hakims, unqualified gentlemen who cannot be relied upon to make diagnoses "according to nomenclature." Dr. Temulji B. Nariman thought that there would be no difficulty in obtaining correct information in regard to the incidence of epidemic disease and that medical practitioners would be glad to give the required notices if there was no fear as to what the result might be; as it was, the people dreaded the advent of an army of municipal lascars for purposes of disinfection. This had happened during the plague epidemic, and the result was that the people preferred to have nothing to do with members of the medical faculty. Dr. Ismail Jan Mahomed doubted whether the dispensaries could be used for the treatment of disease and at the same time as a means of ensuring the correctness of death certificates. More dispensaries were needed; on this point he insisted strongly. He maintained that no dead body should be either buried or burnt until a certificate from a medical man was obtained. In the case of the poor who preferred to be treated by vaids and hakims he suggested that in all cases of serious illness the matter should be reported to the nearest municipal medical officer of health who would see the patient and who would then be prepared to sign a death certificate should it be rendered necessary by the course of the disease. It does not appear certain that correct diagnosis would be ensured by this means. In favour of his proposal Dr. Mahomed pointed out that the expenditure which would be incurred in supplying medicines would be saved and thus it would be possible to engage more medical men for registration purposes.

Dr. N. F. Surveyor criticised Dr. Turner's scheme from an entirely different standpoint. Thirty charitable dispensaries in a city containing a population of over 800,000 inhabitants, of which at least half were poor, would, he

thought, not provide the means for collecting better data than those already available. In favour of his scheme for the provision of free dispensaries Dr. Turner for his part contended that they would enable the people to get medical advice and to obtain also the benefits to be derived from disinfection. At the same time the Public Health Department would be enabled to get information as to the incidence of disease. It would be necessary to enforce the law and its penalties on the medical men who failed to notify the existence of infectious disease. In order that the scheme which he advocated might be effectively carried out it was absolutely necessary that the sanitary administration of the city should be vested in the Public Health Department. The control of infectious diseases in any city is impossible without such powers. When to the ordinary difficulties which a health officer has to combat in European towns are added the obstacles due to religious customs and habits as well as indifference to life, all attempts made in the direction of control of infectious diseases are abortive and ineffectual, imposing a false sense of security. No man experienced in the administration of public health would think otherwise.

Assuming that the municipality of Bombay, under advice of the Municipal Commissioner and subject to the Government of India, desire to place the city of Bombay on an equal footing with some other cities of the empire, Dr. Turner points out that unless ample powers are given to the executive health officer it will be useless to attempt to control any existing or future epidemic. The powers for which Dr. Turner asks are very great. Such powers, to be of use, must be exercised with tact as well as with firmness. Radical changes in the sanitation of Bombay are evidently necessary. They have long been required. The present state of things is the result of years of neglect on the part of the responsible authorities. And this fact is a great argument in favour of Dr. Turner's drastic proposals.

SANITATION AND THE GLASGOW INTERNATIONAL CONGRESS OF ENGINEERS.

(FROM OUR SPECIAL COMMISSIONER.)

The Utilisation of Micro-organisms in the Purification of Sewage.—The Housing of the Poor.

THERE has been a great gathering of engineers at Glasgow. The University was placed at their disposal and more than 2000 engineers attended, including a few foreign members of this profession. The Congress met from Sept. 3rd to the 6th, and was subdivided into nine sections. In the seventh section, entitled Municipal Engineering, there were several questions discussed intimately connected with the preservation of public health, such as the treatment of sewage, water-supply, and the housing of the poor. Here once more the well-worn theories in favour of utilising agricultural land for the purification of sewage found an eloquent advocate in the person of Lieutenant-Colonel ALFRED S. JONES, C.E., V.C. Other methods, however, were not ignored, and Colonel Jones also recognised that Lord Bramwell's Royal Commission, so far back as 1884, had pronounced an opinion on the necessity of adopting the separate system in sewage wherever possible. In practice it seemed as if the reverse was done—namely, that the separate system was only adopted where the combined system was found to be impossible. Much was said about filtration in artificially prepared beds of coke and the bacteriological treatment of sewage either with or without covered "septic tanks." But the objection to these latter methods was the great variety in the composition of sewage. It was pointed out that a process which was successful for one town failed when applied to another town. Of course sewage varies according to the local industries, the nature of the refuse and waste from the factories, &c. No one, however, seems to have pointed out that where the separate system was adopted the quality of the sewage would be almost identical if the waste water from factories was drained away with the rain-water, and thus dealt with separately from the sewage proper. Colonel Jones made a useful criticism when he remarked that, whatever the system adopted, there was a tendency, when once the works were completed and paid for, to take little further interest in the matter. Careless and incompetent workmen were employed at inadequate wages to carry out duties that often varied from hour to hour. The satisfactory working, the true average duration of filtering beds for sewage, had not yet been ascertained. The process required skilled and intelligent superintendence. The best system would fail if not properly controlled. Where coke filtering beds were employed these should be connected by a tramway to the boiler station for the production of power for electricity, &c. Thus the coke which had served for the purification of sewage could in its turn be purified and utilised by passing through the furnace. It was said that one acre of artificially prepared bed of coke could purify 1,000,000 gallons of sewage per day; but such a rule could not be absolute and there must be men present capable of carrying out modifications according to the circumstances. All these methods were described by Colonel Jones as the treatment of sewage under difficulties which necessitated great concentration of microbe energy on a confined area. Evidently he preferred the employment of this energy on a broad area as in sewage-farming and spoke of the 20,000 acres near Berlin all under sewage and of convalescent homes flourishing in the midst of land well irrigated with the sewage of the Prussian capital. He extolled what had been done near Paris on the same principle and in sewage-farms such as those of Birmingham, Nottingham, and Leicester. He declared that in such cases there was a complete absence of clogging, some return in crops for the labour of cultivating, and that the freehold rose in intrinsic value as a corporation asset which might ultimately be used for some other and more profitable purpose.

This paper was followed by a description of what had been done at Huddersfield where the staple woollen trade imparted fat, soap, dyes, and a variety of chemicals to the sewage. Chemical precipitation and sand filters had been tried, but these latter were rapidly clogged and no system of cleansing the beds worked satisfactorily. They had to be entirely renewed and this was too expensive. Contact-beds and open septic tanks were then tried. It was found that the beds had to be re-laid at least once in two years and that for such renewals a large amount of space was necessary. Again, therefore, the process was too costly. Chemical precipitation did not remove the colour of the dyes in the sewage, and the effluent was sometimes quite clear, sometimes very turgid. The contact-beds did remove some of the colouring matter but were more successful in the purification effected as measured by the albuminoid-ammonia or oxygen-absorbed tests. The same was noticed when the sewage was not subjected to precipitation, but placed in a raw condition on the contact-beds. Even now the result was not yet satisfactory; but when the sewage was passed through a second contact-bed composed of clinker 151 samples of the effluent had been placed in the incubator in stoppered bottles for seven days at 80° F. and no putrescence had resulted. Then septic tanks had been tried, with the result that they had one foot three inches of sludge after 18 weeks, one foot seven inches after 30 weeks, and two feet four inches after 44 weeks. Mr. K. F. CAMPBELL, whose paper supplied these details, concluded that no process could prevent the formation of sludge, but in the open septic tank about 40 per cent. of the sludge was destroyed. He thought that the effluent of the septic tanks more rapidly destroyed the filtering beds than that of the precipitating tanks, for it contained more suspended matter; but he recognised that his experience might differ from the experience of other engineers—a fact which showed that no one system could be applied to all localities.

In the course of the discussion Mr. FOWLER of Leeds maintained that the success of bacteriological beds depended on the skill of the superintendent.—Mr. MIDGLEY TAYLOR said that he had calculated that the cost of cleaning a bacteriological filtering bed would amount to from £200 to £250 per annum per acre. The cost of cleansing was often forgotten and it was an important item.—Mr. A. J. MARTIN of Exeter pointed out that the system of sewage-farms was too often in conflict with the interests of the ratepayers to be very reliable. He defended the closed as opposed to the open septic tanks. The cost of roofing them over was not great, and it was most necessary to exclude atmospheric air and to maintain an equable temperature. Then it prevented an enormous quantity of flies from breeding on the scum on the surface of the sewage. At Exeter, during five years, the only expense incurred was the washing off of 18 inches of material from the filtering beds.

Mr. PRICE of Birmingham argued that expense depended on

the quality of the sewage, which, for instance, was seven times stronger at Birmingham than at Leicester. For the present they had land enough for the Birmingham sewage-farms, but the time might come when they would have to employ septic tanks, and these would be open tanks, as they were cheaper.

Mr. S. S. PLATT of Rochdale said that they had been experimenting for two years and found that the septic tanks must be covered over. It was necessary that a scum should form on the top of the water and this would be blown away by the wind or broken by the rain if the tank was not covered.

Mr. MUNTZ of Belfast said that his experience had shown that broken bricks were the best filtering material and he thought the bacteriological system the most suitable.

Mr. CORBETT of Salford related that during five years the filtering beds there had, if anything, improved. They only required occasional raking of the surface.

After a few words from the CHAIRMAN (Mr. GEORGE MAWBREY of Leicester), who pointed out that it had been conclusively established that any kind of sewage could be satisfactorily clarified by bacteriological treatment, the discussion was closed.

From this discussion it will be seen that when the experiments made at Exeter on the utilisation of micro-organisms in the purification of sewage were described at length in THE LANCET[1] a subject was then opened out which was destined to take a leading place in the study of the problem of sewage disposal. The question was then comparatively new and now it is discussed on all sides. Nevertheless, it is still so far new that as yet the most divergent opinions prevail. Medical men are criticised because they sometimes fail to agree. If this be a failing of the medical profession what will be said of the engineering profession? Rarely have so many flat contradictions been uttered in so short a space of time and by so many eminent authorities. Indeed, it seemed as every speaker rose mainly for the purpose of explaining that he disagreed with some other speaker; and the outsider who came for the purpose of obtaining some clear indications of what was to be done must have gone away sorely perplexed and disappointed.

On the following day, after Mr. MANSERGH had given an interesting account of the new works for the water-supply of Birmingham, the subject of sewage disposal was reopened by Mr. A. B. M'Donald, the city engineer of Glasgow. He described the drainage of Glasgow and the adjacent boroughs which extended over 39 square miles. There were three main collectors and outfalls. The suspended matter in the sewage varies from 20 to 250 grains per gallon, and there were 95,000,000 gallons of sewage per day in dry weather. The sewage was treated by the process of precipitation with the aid of hydrate of lime and sulphate of aluminium. The result was the removal of the suspended matter, and 30 per cent. of purification was attained, calculated on the basis of oxygen absorbed in four hours at 27° F. This was far from perfect, but the water in which the sewage was thrown at the nearest outfall was in volume 40 times more than the quantity of sewage, and it was tidal water. Further down at the other outfall the dilution was much greater. New and improved precipitation tanks were in course of construction.

Mr. F. W. MAGER of Wallsend presented an important paper on the subsidence of sewers in mining districts. When this happened the local authorities had to re-lay the sewers at their own expense. If, however, there was a subsidence of a highway the law protected the highway and made those who had caused the damage pay for the repairs, but the alteration of the level of a road was a small matter as compared to the alteration of the level of a sewer. The entire scheme of drainage might be destroyed by a sudden change in the levels. If the coal-owners had to repair the roads they damaged it was still more necessary that they should repair the sewers. When mining operations caused a subsidence which made a sewer give way the health of the locality was seriously endangered. That the law should protect the roads and not the sewers was certainly an extraordinary anomaly and could only be explained by the fact that roads were made a subject for legislation long before sewers existed.

The last two days were devoted mainly to the housing problem, including therein the question of cheap transit, mainly by tramways. The over-head wire seemed to find the most favour as it gave the best financial results and much was said concerning the laying of the lines so as best to stand the wear of the traffic. In regard to the housing question itself the principal paper was read by Mr. A. H. CAMPBELL, the engineer of the East Ham Council. In this district they were now building 540 single and double tenement houses at a cost of £120,000 in combination with a system of cheap tramways. The entire scheme was so contrived as to pay its own expenses without increasing the rates, but this meant higher rents than were desirable. The maximum wage of the class of tenants for whom these dwellings were needed should not exceed 30*s.* a week. They gave a kitchen measuring 144 superficial feet; a scullery of 70 feet superficial area, containing a small range for use in summer, a copper, and a bath. Then there was a parlour that could be used as a bedroom, measuring 125 feet, and a bedroom of 96 feet—in all, 435 superficial feet—together with arrangements for coals, an outside water-closet, clothes closets, and a larder. No subletting was allowed. The cottages or tenements with three bedrooms had to be let at 7*s.* a week, and the working men were made to pay this high rent so as to create a valuable property for the next generation, by which time the capital expenditure would be refunded. The rents should be estimated not by the number of rooms but per 100 feet of superficial measurement. Thus calculated the greater part of the dwellings built by the East Ham Council would be rented at from 1*s.* 4*d.* to 1*s.* 7*d.* per week per 100 feet. At Richmond the cost for double tenements was 1*s.* 6*d.* and 1*s.* 7*d.* The cheapest buildings were Messrs. Dick, Kerr and Co.'s workmen's houses at Preston which only cost 11*d.* the 100 square feet. Dwellings cheap enough to meet the wants of the poorer classes could only be obtained by throwing a part of the burden on the rates or by reducing the initial expense and taxation.

The discussion that followed did not throw much light on the subject. Mr. MUNTZ of Belfast thought that it was absurd to build gentlemen's houses for working men and that the houses should be of the flimsiest materials because it was so much trouble to pull down a good house. He seemed to think that workmen did not want good accommodation. The great thing was cheapness and houses that could be pulled down without any great sacrifice as soon as a better class of tenants could be obtained for the district. When the scandalous condition of the homes of the poor at Belfast—where there are 20,000 houses with no back passages and the contents of the middens have to be carried through the living rooms—is taken into consideration, it is not surprising that a representative from that town should treat this question in so disparaging a manner. This idea of levelling downwards did not meet with approval. The rehousing of the poor is an opportunity of raising the conceptions of decency which have been allowed to fall so low as to be a menace to the health and morals of the community. It is also an accepted principle, which finds its expression in our legislation on the subject, that the poor are not to be driven from the localities in which they live. On the contrary, when an insanitary area is cleared this must be done on the express condition that houses for the same class of people are to be rebuilt on the same spot. Therefore there is every advantage in building such dwellings with good and lasting material. At East Ham tenders were invited, but none were under 6¼*d.* per cubic foot of structure raised. The East Ham Council thereupon determined to do the work themselves and have succeeded in carrying out the high-class specifications for 4¼*d.* per cubic foot. This was considered a good argument in favour of municipal enterprise.

The Congress met only in the mornings. The afternoons were devoted to visiting the many public works that, in some respects, have made Glasgow a model city. Thus there have been object-lessons as well as theoretical discussions.

[1] THE LANCET, Dec. 5th, 1896, p. 1631.

SOME MEDICAL ASPECTS OF THE PAN-AMERICAN EXPOSITION AT BUFFALO.

(FROM OUR SPECIAL CORRESPONDENT.)

THE exposition now being held at Buffalo is on the whole a very satisfactory display, whether from an instructive, an amusing, or a spectacular point of view. It would, of course, be unfair to compare it with the international exhibitions which have taken place within the past few years. In size and scope of exhibits the Chicago and Paris world's fairs easily surpassed it. The fact, however, should be borne in

mind that the exhibition at Buffalo is restricted to exhibitors from the American continents, and as such it amply justifies its existence. There is one feature which stands out with especial prominence in the exposition at Buffalo. The electric lighting is magnificent and is the very best of its kind ever carried out or attempted.

The medical phases of the exposition are various, but of all the exhibits that of the medical department of the United States Army is at once the most complete and the most interesting. The claim is advanced by the surgeons of the United States army that the organisation and equipment of their department are the best in the world. Perhaps so far as the organisation is concerned the justice of this assertion may be denied by the army authorities of many countries. The Germans, for instance, would assuredly vigorously contend that their army medical service is unapproached in this respect; but with regard to the *matériel*, the equipment, and the transportation facilities of this branch of the United States army, the affirmation as to superiority may be made without the accusation of undue boasting being levelled at the Americans. At the present juncture any points bearing on this subject should be of especial interest in Great Britain, seeing that the Royal Commission upon the South African Hospitals recently found that the ambulances, wagons, and tents in use in the British army were defective and inadequate. The conditions now prevailing in the Army Medical Department of the United States with regard to the equipment and medical supplies of field hospitals are the outcome of the serious and careful deliberations of a committee of three experts who for the space of nearly two years studied minutely the systems and methods in vogue of the army medical services of the principal nations of the world both by personal observation and by correspondence. They adopted those features which they thought good, strengthening and improving those which they considered weak, and finally evolved a system.

The exhibit of the United States Army Medical Department at Buffalo is a practical illustration of the improvements effected in field hospitals as a result of the suggestions of the committee, and consists of a model brigade field hospital under the charge of Captain Edward L. Munson, who is an assistant surgeon in the United States Army. This hospital has a capacity of 100 beds; as a brigade at war strength numbers 5375 men accommodation for a proportion of about 2 per cent. of the total command is thus provided. The hospital tent wards are arranged in the form of a Geneva cross, the space in the centre being covered in. The arms of the cross contain the medical and surgical tents, mess-kitchen, and office tents, this position having been found to economise space as well as to save time in pitching the camp. With respect to the equipment I must touch on two points, the hospital tents and the medical chests. Dr. J. Lane Notter, the well-known writer on military hygiene, lays down as the essentials of a good military tent the following: (1) that it should be waterproof; (2) that it should be ventilated by large outlets near the roof; (3) that in the tropics a double fly be provided; (4) that it should be as light as possible; and (5) that the colour should be quiet. The ward tents used in the exhibit at Buffalo comply as nearly as possible with these conditions. The tents are the invention of Captain Munson and have recently been adopted by the medical department of the United States Army. The advantages claimed for them are better ventilation, lower temperatures in the tent with the walls down and also with the walls up, free lateral ventilation when tents are pitched together to form a ward, and greater capacity. The tent is made with an opening at the top, two feet on each side of the ridge and the full length of the tent, except one foot at each end, this space being filled by netting. The fly is raised one foot above the roof of the tent, thereby giving free circulation of air. The ridge is made in two parts to render transportation easy. Each tent measures 15 feet by 14 feet and contains six beds. The colour outside is a khaki drab, whilst the interior is lined with a white material. The trial to which this tent was subjected in Cuba and in the Philippines has convinced the army authorities of the United States that it is the best for hot climates as yet produced, and as it has given such satisfaction in the United States army it might be worthy of a trial in the British army.

The other exhibits to which reference must be here made are the medical, surgical, and steriliser chests carried with a field hospital, the three forming a regimental set. The new model medical chest combines the strictest economy of space with sufficiency of material. It weighs about 85 pounds and contains enough medicines to serve 1600 men for 90 days. The chest contains no drawers or partitions, but infinite ingenuity has been displayed in packing its contents into the smallest possible compass. Of the regimental set of chests, one can be carried by one man and two by two men, whilst the three together constitute a pack-mule load.

I hope to send you later a few words about the ambulances, ambulance wagons, mess rations, and other details of a United States field hospital equipment.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In 33 of the largest English towns 6247 births and 4613 deaths were registered during the week ending August 31st. The annual rate of mortality in these towns, which had been 21·3 and 21·6 per 1000 in the two preceding weeks, declined again in that week to 21·0. In London the death-rate was 18·6 per 1000, while it averaged 22·5 in the 32 large provincial towns. The lowest death-rates in these towns were 12·0 in Bristol, 13·8 in Swansea, 15·1 in Cardiff, and 15·9 in Halifax; the highest rates were 28·5 in West Ham, 29·3 in Hull, 30·2 in Newcastle, and 32·1 in Gateshead. The 4613 deaths in these towns in the week included 1506 which were referred to the principal zymotic diseases, against 1620 and 1639 in the two preceding weeks; of these 1219 resulted from diarrhœal diseases, 89 from measles, 63 from whooping-cough, 50 from diphtheria, 46 from "fever" (principally enteric), 32 from scarlet fever, and seven from small-pox. The lowest death-rates from these diseases were recorded in Bristol, Cardiff, Swansea, and Halifax; and the highest rates in West Ham, Croydon, Preston, Hull, and Gateshead. The greatest proportional mortality from measles occurred in West Ham, Wolverhampton, Oldham, and Sheffield; from whooping-cough in Plymouth and Newcastle; from "fever" in Nottingham; and from diarrhœal diseases in West Ham, Croydon, Preston, Hull, and Gateshead. The mortality from scarlet fever showed no marked excess in any of the large towns. The 50 deaths from diphtheria included 22 in London, four in Liverpool, four in Sheffield, and three in Birmingham. Seven fatal cases of small-pox were registered in London during the week, but not one in any other of the 33 large towns. There were 74 small-pox patients under treatment in the Metropolitan Asylums hospitals on Saturday, August 31st, against 11, 13, and 41 on the three preceding Saturdays; 52 new cases were admitted during the week, against three, eight, and 30 in the three preceding weeks. The number of scarlet fever patients in these hospitals and in the London Fever Hospital, which had declined from 3148 to 3040 at the end of the two preceding weeks, had further declined to 3008 on August 31st; 303 new cases were admitted during the week, against 306, 290, and 273 in the three preceding weeks. The deaths referred to diseases of the respiratory organs in London, which had been 103 and 126 in the two preceding weeks, declined again to 114, but were 20 below the corrected average. The causes of 33, or 0·7 per cent., of the deaths in the 33 towns were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Bristol, Nottingham, Leeds, Sheffield, and 13 other smaller towns; the largest proportions of uncertified deaths were registered in Leicester, Liverpool, Manchester, and Newcastle.

In 33 of the largest English towns 6599 births and 2470 deaths were registered during the week ending Sept. 7th. The annual rate of mortality in these towns, which had been 21·6 and 21·0 per 1000 in the two preceding weeks, further declined to 19·4 per 1000 last week. In London the death-rate was 16·9 per 1000, while it averaged 21·1 per 1000 in the 32 large provincial towns. The lowest death-rates in these towns were 9·5 in Bristol, 13·6 in Cardiff, 14·3 in Derby, and 14·8 in Huddersfield; the highest rates were 25·4 in West Ham, 26·3 in Hull, 27·1 in Newcastle, and 36·8 in Gateshead. The 2470 deaths in these towns last week included 1256 which were referred to the principal zymotic diseases, against 1639 and 1506 in the three preceding weeks; of

these, 1000 resulted from diarrhœal diseases, 65 from diphtheria, 52 from "fever" (principally enteric), 47 from whooping-cough, 46 from measles, 39 from scarlet fever, and seven from small-pox. The lowest death-rates last week from these diseases were recorded in Bristol, Cardiff, Swansea, and Huddersfield; and the highest rates in West Ham, Leicester, Salford, Hull, Sunderland, and Gateshead. The greatest proportional mortality from measles occurred in West Ham, from "fever" in Nottingham, and from diarrhœal diseases in Croydon, Wolverhampton, Leicester, Hull, Sunderland, and Gateshead. The mortality from scarlet fever and from whooping-cough showed no marked excess in any of the large towns. The 65 deaths from diphtheria included 20 in London, six in West Ham, six in Manchester, five in Sheffield, and four in Leeds. Seven fatal cases of small-pox were registered in London, but not one in any of the 32 large provincial towns. There were 92 cases of small-pox under treatment in the Metropolitan Asylums hospitals on Saturday last, against 11, 13, 41, and 74 at the end of the four preceding weeks; 31 new cases were admitted during the week, against eight, 30, and 52 in the three preceding weeks. The number of scarlet fever patients in these hospitals and in the London Fever Hospital, which had declined from 3148 to 3008 at the end of the four preceding weeks, had further decreased to 2994 on Saturday, Sept. 7th; 346 new cases were admitted during the week, against 290, 273, and 303 in the three preceding weeks. The deaths referred to diseases of the respiratory organs in London, which had been 126 and 114 in the two preceding weeks, rose again last week to 124, but were 17 below the average. The causes of 39, or 0·9 per cent., of the deaths in the 33 towns last week were not certified either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in West Ham, Manchester, Salford, Bradford, Newcastle, and in 12 other smaller towns; the largest proportions of uncertified deaths were registered in Birmingham, Liverpool, Preston, and Gateshead.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in the eight Scotch towns, which had been 19·2, 19·0, and 17·8 per 1000 in the three preceding weeks, further declined to 17·4 during the week ending August 31st, and was 3·6 below the mean death-rate during the same period in the 33 large English towns. The death-rates in these Scotch towns ranged from 7·9 in Perth and 14·5 in Aberdeen to 18·8 in Edinburgh and 22·8 in Paisley. The 555 deaths in these towns included 81 which were referred to diarrhœa, 12 to measles, 12 to whooping-cough, 11 to "fever," two to diphtheria, and one to scarlet fever. In all 119 deaths resulted from these principal zymotic diseases during the week, against 168, 150, and 124 in the three preceding weeks. These 119 deaths were equal to an annual rate of 3·7 per 1000, which was 3·2 per 1000 below the zymotic death-rate during the same period in the 33 large English towns. The fatal cases of diarrhœa, which had been 129, 111, and 92 in the three preceding weeks, further declined to 81, of which 45 occurred in Glasgow, 16 in Edinburgh, 14 in Dundee, six in Paisley, four in Leith, three in Aberdeen, and three in Greenock. The deaths from measles, which had been 13, 11, and 12 in the three preceding weeks, were again 12, and were all registered in Glasgow. The fatal cases of whooping cough, which had been 16 and eight in the two preceding weeks, rose again to 12, of which three were recorded in Glasgow, three in Edinburgh, two in Dundee, and two in Paisley. The deaths referred to different forms of "fever," which had been five and nine in the two preceding weeks, further increased to 11 and included seven in Glasgow, two in Edinburgh, and two in Paisley. The deaths resulting from diseases of the respiratory organs in these towns, which had been 53 and 51 in the two preceding weeks, rose again to 62, and were slightly in excess of the number registered in the corresponding period of last year. The causes of 20, or nearly 4 per cent., of the deaths in these eight towns were not certified.

The annual rate of mortality in the eight Scotch towns, which had declined from 19·8 to 17·4 per 1000 in the five preceding weeks, rose again to 17·8 per 1000 during the week ending Sept. 7th, but was 1·6 below the mean-rate during the same period in the 33 large English towns. The rates in the eight Scotch towns ranged from 16·2 in Aberdeen and 16·7 in Edinburgh to 22·1 in Greenock and 23·4 in Leith. The 568 deaths in these towns last week included 77 from diarrhœa, 13 from whooping-cough, eight from measles, six from "fever," five from scarlet fever, and two from diphtheria. In all, 111 deaths resulted from these principal zymotic diseases last week, against numbers decreasing from 174 to 119 in the five preceding weeks. These 111 deaths were equal to an annual rate of 3·5 per 1000, which was 2·2 per 1000 below the mean rate from the same diseases last week in the 33 large English towns. The fatal cases of diarrhœa, which had been 111, 92, and 81 in the three preceding weeks, further declined last week to 77, of which 26 occurred in Glasgow, 17 in Edinburgh, nine in Leith, seven in Dundee, six in Aberdeen, five in Paisley, five in Greenock, and two in Perth. The deaths from whooping-cough, which had been eight and 12 in the two preceding weeks, further rose to 13 last week, and included seven in Glasgow and two in Edinburgh. The fatal cases of measles, which had been 12 in each of the two preceding weeks, declined last week to eight, of which six were registered in Glasgow and two in Dundee. The deaths referred to different forms of "fever," which had been five, nine, and 11 in the three preceding weeks, decreased again to six last week, and included four in Glasgow. The fatal cases of scarlet fever, which had been three, three, and one in the three preceding weeks, rose last week to five, of which two occurred in Greenock. The deaths referred to diseases of the respiratory organs in these towns, which had been 51 and 62 in the two preceding weeks, declined again to 60 last week, and were 19 below the number in the corresponding period of last year. The causes of 21, or nearly 4 per cent. of the deaths in these eight towns last week were not certified.

HEALTH OF DUBLIN.

The death-rate in Dublin, which had been 19·9 and 24·5 per 1000 in the two preceding weeks, declined again to 23·5 during the week ending August 31st. During the previous three weeks the death-rate had averaged 22·6 per 1000, the rates during the same period being 19·1 in London and 18·1 in Edinburgh. The 169 deaths of persons belonging to Dublin registered during the week under notice showed a decline of seven from the number in the preceding week, and included 35 which were referred to the principal zymotic diseases, against 34 in each of the three preceding weeks; of these 28 resulted from diarrhœa, two from scarlet fever, two from diphtheria, two from "fever," and one from whooping-cough. These 35 deaths were equal to an annual rate of 4·9 per 1000, the zymotic death-rates during the same period being 5·3 in London and 3·6 in Edinburgh. The fatal cases of diarrhœa, which had been 33, 30, and 32 in the three preceding weeks, declined again to 28. The 169 deaths in Dublin included 49 of children under one year of age and 36 of persons aged upwards of 60 years; the deaths both of infants and of elderly persons showed a slight decline from the respective number recorded in the preceding week. Ten deaths from violence and seven inquest cases were registered; and 51, or nearly one-third, of the deaths occurred in public institutions. The causes of 9, or more than 5 per cent., of the deaths in Dublin were not certified.

The death-rate in Dublin, which had been 19·9, 24·5, and 23·5 per 1000 in the three preceding weeks, further declined during the week ending Sept. 7th to 20·6. During the past four weeks the death-rate has averaged 22·1 per 1000, the rates during the same period being 18·6 in London and 17·9 in Edinburgh. The 148 deaths of persons belonging to Dublin registered during the week under notice were 21 below the number in the preceding week, and included 35 which were referred to the principal zymotic diseases, the number of deaths from the same diseases having been 35 in the preceding week also; these 35 deaths were equal to an annual rate of 4·9 per 1000, the zymotic death-rates during the same period being 4·2 in London and 3·4 in Edinburgh. The fatal cases of diarrhœa, which had been 30, 32, and 28 in the three preceding weeks, rose again last week to 29. The two deaths from scarlet fever corresponded with the number in the preceding week. The 148 deaths in Dublin last week included 51 of children under one year of age and 25 of persons aged upwards of 60 years; the deaths of infants showed a slight excess, while those of elderly persons were considerably below the number in the preceding week. Four inquest cases and one death from violence were registered;

ANALYSIS OF SICKNESS AND MORTALITY STATISTICS IN LONDON DURING AUGUST, 1901.

(Specially compiled for THE LANCET.)

CITIES AND BOROUGHS.	Estimated population in the middle of 1901.	NOTIFIED CASES OF INFECTIOUS DISEASE.											DEATHS FROM PRINCIPAL INFECTIOUS DISEASES.											Deaths from all causes.	Death-rate per 1000 living.	Deaths of infants under one year to 1000 births.
		Small-pox.	Scarlet fever.	Diphtheria.*	Typhus fever.	Enteric fever.	Other continued fevers.	Puerperal fever.	Erysipelas.	Cholera.	Total.	Annual rate per 1000 persons living.	Small-pox.	Measles.	Scarlet fever.	Diphtheria.*	Whooping-cough.	Typhus fever.	Enteric fever.	Other continued fevers.	Diarrhœal diseases.	Total.	Annual rate per 1000 persons living.			
LONDON	4,543,757	94	1360	899	2	337	2	21	315	1	3011	8·6	10	143	51	102	79	1	57	—	1504	1947	5·6	6458	18·5	268
West Districts.																										
Paddington	144,154	—	23	19	—	10	—	1	9	—	62	5·6	—	—	1	1	—	—	2	—	50	54	4·9	170	15·4	265
Kensington	176,787	—	47	9	—	13	—	1	19	—	89	6·6	—	1	2	—	2	—	3	—	49	57	4·2	213	15·7	263
Hammersmith	112,619	—	26	15	—	8	—	—	12	—	61	7·1	1	4	—	5	4	—	5	—	51	70	8·1	192	22·2	353
Fulham	138,426	—	29	29	—	30	—	3	12	—	103	9·7	—	1	—	1	5	—	6	—	90	103	9·7	219	20·6	373
Chelsea	73,879	1	9	6	—	1	—	1	2	—	20	3·5	—	—	—	2	1	—	—	—	16	19	3·4	77	13·6	236
City of Westminster	182,502	3	32	19	—	4	—	2	9	—	69	4·9	1	10	1	3	2	—	2	—	28	47	3·4	194	13·9	213
North Districts.																										
St. Marylebone	133,060	17	20	21	—	8	—	1	14	—	81	7·9	1	2	1	2	3	—	1	—	37	47	4·6	160	15·7	168
Hampstead	82,287	1	9	8	—	4	—	—	3	—	25	4·0	—	1	—	—	1	—	1	—	10	13	2·1	69	10·9	192
St. Pancras	235,297	49	56	74	—	18	—	3	20	—	220	12·2	4	4	4	8	2	—	2	—	62	86	4·8	317	17·6	256
Islington	335,325	3	115	82	—	31	—	—	19	—	250	9·7	—	10	5	16	5	—	3	—	81	120	4·7	414	16·1	249
Stoke Newington	51,328	2	12	10	—	3	—	1	—	—	28	7·1	—	1	1	1	1	—	1	—	12	17	4·3	54	13·7	301
Hackney	219,780	5	66	70	1	16	—	2	30	1	191	11·3	—	1	2	6	6	—	2	—	59	76	4·5	277	16·4	221
Central Districts.																										
Holborn	59,206	5	18	16	—	8	—	—	8	—	55	12·1	2	6	—	1	1	—	2	—	16	28	6·2	86	18·9	217
Finsbury	101,233	2	44	30	—	6	—	1	9	—	92	11·3	—	6	—	5	3	—	1	—	31	46	5·9	170	21·9	148
City of London	26,627	—	5	5	—	—	—	—	—	—	10	4·9	—	—	—	2	—	—	—	—	2	4	2·0	42	20·6	278
East Districts.																										
Shoreditch	118,564	—	25	37	—	8	1	—	9	—	80	8·8	—	10	1	3	2	—	—	—	33	49	5·4	188	20·7	229
Bethnal Green	129,700	1	78	49	—	9	1	—	10	—	148	14·9	—	9	9	6	3	—	1	—	50	78	7·8	236	23·7	260
Stepney	290,824	—	108	86	1	28	—	—	21	—	244	10·6	—	21	3	3	10	1	4	—	101	143	6·2	530	23·1	286
Poplar	168,887	—	25	43	—	20	—	—	10	—	98	7·6	—	8	1	7	4	—	1	—	65	86	6·6	285	22·0	257
South Districts.																										
Southwark	206,219	2	118	39	—	16	—	—	12	—	187	11·8	—	4	6	3	1	—	1	—	86	101	6·4	355	22·4	289
Bermondsey	130,348	—	95	26	—	24	—	1	11	—	157	15·7	—	3	7	4	1	—	7	—	56	78	7·8	227	22·7	274
Lambeth	302,460	1	72	28	—	10	—	1	15	—	127	5·5	1	7	—	5	4	—	—	—	106	123	5·3	437	18·8	238
Battersea	169,364	—	42	12	—	8	—	—	8	—	70	5·4	—	19	1	—	4	—	2	—	94	120	9·2	287	22·1	384
Wandsworth	233,943	2	48	25	—	8	—	—	13	—	96	5·3	—	2	1	3	3	—	3	—	77	89	5·0	264	14·7	258
Camberwell	259,897	—	115	67	—	12	—	2	14	—	210	10·5	—	4	5	8	6	—	2	—	80	105	5·3	370	18·6	272
Deptford	110,752	—	34	30	—	4	—	—	6	—	74	8·7	—	1	—	4	2	—	2	—	34	43	5·1	150	17·7	259
Greenwich	96,188	—	24	14	—	12	—	1	6	—	57	7·7	—	3	—	3	2	—	—	—	35	43	5·8	149	20·2	292
Lewisham	128,423	—	22	12	—	10	—	—	7	—	51	5·2	—	4	—	—	—	—	—	—	40	44	4·5	153	15·5	307
Woolwich	117,619	—	23	18	—	7	—	—	6	—	54	6·0	—	1	—	—	1	—	3	—	53	58	6·4	173	19·2	306
Port of London	—	—	—	—	—	1	—	—	1	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Including membranous croup.

and 41, or nearly one-third, of the deaths occurred in public institutions. The causes of five, or more than 3 per cent., of the deaths in Dublin last week were not certified.

VITAL STATISTICS OF LONDON DURING AUGUST, 1901.

IN the accompanying table will be found summarised complete statistics relating to sickness and mortality in each of the cities and boroughs in the county of London. With regard to the notified cases of infectious diseases it appears that the number of persons reported to be suffering from one or other of the nine diseases specified in the table was equal to an annual rate of 8·6 per 1000 of the population, provisionally estimated at 4,543,757 persons in the middle of this year. In the three preceding months the rates had been 8·5, 8·5, and 9·6 per 1000 respectively. The rates were considerably below the average in Chelsea, City of Westminster, Hampstead, City of London, and Lewisham, while they showed the largest excess in St. Pancras, Holborn, Finsbury, Bethnal Green, Southwark, and Bermondsey. During the four weeks ending August 31st 94 cases of small-pox were notified in London, against three, four, and 22 in the three preceding months; 49 cases belonged to St. Pancras, 17 to St. Marylebone, five to Hackney, and five to Holborn. 93 cases were admitted into the Metropolitan Asylums hospitals during the month, and 74 remained under treatment on August 31st. The prevalence of scarlet fever showed a marked diminution from that recorded in recent months; among the various metropolitan boroughs this disease was proportionally most prevalent in Finsbury, Bethnal Green, Stepney, Southwark, Bermondsey, and Camberwell. The Metropolitan Asylums hospitals contained 2971 scarlet fever patients at the end of August, against 2291, 2752, and 3026 at the end of the three preceding months; the weekly admissions averaged 288, against 339, 343, and 355 in the three preceding months. The prevalence of diphtheria showed a slight decline from that recorded in the preceding month; the greatest proportional prevalence of this disease occurred in St. Pancras, Hackney, Finsbury, Shoreditch, and Bethnal Green. There were 1336 diphtheria patients under treatment in the Metropolitan Asylums hospitals at the end of August, against 1101, 1169, and 1332 at the end of the three preceding months; the weekly admissions averaged 177, against 160, 175, and 209 in the three preceding months. The prevalence of enteric fever was considerably in excess of that recorded in the preceding month; among the various metropolitan boroughs this disease was proportionally most prevalent in Fulham, Holborn, Poplar, Bermondsey, and Greenwich. The number of enteric fever patients under treatment in the Metropolitan Asylums hospitals, which had been 95, 125, and 166 at the end of the three preceding months, further increased to 225 at the end of August; the weekly admissions averaged 42 last month, against 14, 25, and 29 in the three preceding months. Erysipelas was proportionally most prevalent in Kensington, Hammersmith, St. Marylebone, Hackney, and Holborn. The 21 notified cases of puerperal fever included three in Fulham, three in St. Pancras, two in the City of Westminster, two in Hackney, and two in Camberwell.

The mortality statistics in the table relate to the deaths of persons actually belonging to the various metropolitan boroughs, the deaths occurring in the public institutions of London having been distributed among the various boroughs in which the deceased persons had previously resided. During the four weeks ending August 31st the deaths of 6458 persons were registered, equal to an annual rate of 18·5 per 1000, against 15·4, 13·4, and 16·1 per 1000 in the three preceding months. The lowest death-rates last month in the various metropolitan boroughs were 10·9 in Hampstead, 13·6 in Chelsea, 13·7 in Stoke Newington, 13·9 in the City of Westminster, 14·7 in Wandsworth, and 15·4 in Paddington; the highest rates were 22·1 in Battersea, 22·2 in Hammersmith, 22·4 in Southwark, 22·7 in Bermondsey, 23·1 in Stepney, and 23·7 in Bethnal Green. During the four weeks of August 1947 deaths were referred to the principal zymotic diseases; of these, 10 resulted from small-pox, 143 from measles, 51 from scarlet fever, 102 from diphtheria, 79 from whooping-cough, one from typhus fever, 57 from enteric fever, and 1504 from diarrhœal diseases. The lowest death-rates from these diseases occurred last month in Kensington, Chelsea, the City of Westminster, Hampstead, and the City of London; and the highest rates in Hammersmith, Fulham, Bethnal Green, Poplar, Bermondsey, and Battersea. The 10 fatal cases of small-pox were largely in excess of the average and included four belonging to St. Pancras, two to Holborn, one to Hammersmith, one to the City of Westminster, one to St. Marylebone, and one to Lambeth. The 143 deaths from measles slightly exceeded the average number in the corresponding periods of the 10 preceding years; among the various metropolitan boroughs this disease was proportionally most fatal in Holborn, Finsbury, Shoreditch, Bethnal Green, Stepney, and Battersea. The 51 fatal cases of scarlet fever showed a decline of 18 from the corrected average; the greatest proportional mortality from this disease occurred in St. Pancras, Bethnal Green, Southwark, Bermondsey, and Camberwell. The 102 deaths from diphtheria were considerably below the average in the corresponding periods of the 10 preceding years; this disease showed the highest proportional fatality in Hammersmith, Islington, Finsbury, Bethnal Green, Poplar, and Deptford. The 79 fatal cases of whooping-cough were 45 below the corrected average number; among the various metropolitan boroughs this disease was proportionally most fatal in Hammersmith, Fulham, Hackney, Finsbury, Stepney, and Poplar. The 58 deaths referred to "fever" showed an excess over the average number in the corresponding periods of the 10 preceding years; the highest "fever" death-rates occurred in Hammersmith, Fulham, Bermondsey, and Woolwich. The 1504 deaths from diarrhœal diseases were more than 400 in excess of the corrected average number; the proportional mortality from the diseases was highest in Hammersmith, Fulham, Southwark, Bermondsey, Battersea, and Woolwich. In conclusion, it may be stated that the aggregate mortality from these principal zymotic diseases in London during August was nearly 22 per cent. above the average.

Infant mortality in London last month, measured by the proportion of deaths of children under one year of age to registered births, was equal to 268 per 1000. The lowest rates of infant mortality were recorded in City of Westminster, St. Marylebone, Hampstead, Hackney, Holborn, and Finsbury; and the highest rates in Hammersmith, Fulham, Stoke Newington, Battersea, Lewisham, and Woolwich.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE undermentioned Staff Surgeons have been promoted to the rank of Fleet Surgeon:—Ernest Edward Bray, Edward James Biden, William Eames, Charles William Sharples, and Robert William Anderson. Dated August 25th. The following Surgeons have been promoted to the rank of Staff Surgeon:—Percy Vaughan Jackson, Alfred Harold Lissant Cox, and Alexander Maclean. Dated August 22nd.

The following appointments are notified:—Fleet Surgeons: A. Patterson to Pembroke Dockyard; J. D. Henwood to the *President*; G. D. Twigg to the *Benbow*; J. Acheson to the *Illustrious*; and W. S. Lightfoot to the *Amphitrite*. Staff Surgeons: G. A. Draper to the *Boscawen*; R. F. Bowie to the *Empress of India*; John Menary to the *Gladiator*; and J. M. Rogers to the *Amphitrite*. Surgeons: J. Whelan to the *Empress of India*; P. H. M. Star to Jamaica Hospital; J. K. Robinson to the *Wildfire*; H. H. Gill to the *Caledonia*; A. X. Lavertine to the *Impregnable*; R. T. Gilmour to the Royal Marine Light Infantry, Portsmouth Division; E. S. Miller to Haslar Hospital; and W. B. Macleod and S. Conner to the *Iphigenia*.

Deputy Inspector-General of Hospitals and Fleets Richard Samuel Purnell Griffiths has been promoted to the rank of Inspector-General of Hospitals and Fleets in His Majesty's Fleet. Dated July 5th, 1901.

IMPERIAL YEOMANRY.

Buckinghamshire (Royal Bucks Hussars): Surgeon-Lieutenant-Colonel H. W. Kiallmark retires, with permission to retain his rank and to wear the uniform of the regiment on retirement. Dated August 31st, 1901.

Lanarkshire (Queen's Own Royal Glasgow): Hugh Kelly, late Surgeon-Captain 1st Volunteer Battalion Highland Light Infantry, to be Surgeon-Lieutenant. Dated August 31st, 1901.

5th Battalion: Lieutenant G. D. Laing, Medical Officer,

from Imperial Yeomanry Depôt, to be Medical Officer, with the temporary rank of Captain. Dated April 9th, 1901.

ROYAL ARMY MEDICAL CORPS.

Captain William H. P. Lewis, Reserve of Officers, to be Major. Dated Sept. 4th, 1901.

The undermentioned Surgeons-on-probation to be Lieutenants (dated June 29th, 1901):—Frederic William Lambelle, Laurence John Staunton Cahill, Walter Clegg Stevenson, Martyn Cecil Beatty, Joseph Rabotenu Welland, Henry William Long, Theodore Francis Ritchie, Alexander William Sampey, Thomas James Potter, Alexander Jeans Williamson, Ernest Vaughan Aylen, Henry Rogers, William Davis, Joseph Chambers Hastings, and Denis Joseph Fitzgerald O'Donoghue.

Lieutenant-Colonel R. W. Ford, D.S.O., to be Deputy Surgeon, Royal Hospital, Chelsea, vice Lieutenant-Colonel W. J. Macnamara, whose period of service in that appointment has expired. Dated August 17th, 1901.

Lieutenant-Colonel A. Kirwan, retired, has been ordered to Hounslow for duty. Lieutenant A. C. Duffy has embarked for South Africa.

Lieutenant-Colonel A. P. O'Connor is granted the local rank of Colonel whilst holding the appointment of Secretary to the Principal Medical Officer at the Base, Cape Town. Dated Nov. 29th, 1899.

Major R. J. S. Simpson is granted the local rank of Lieutenant-Colonel whilst holding the appointment of Secretary to the Principal Medical Officer of the Forces in South Africa. Dated August 3rd, 1900.

Lieutenant-Colonel Maurice Knox, retired list, who has for some time been in charge of the Cambridge Hospital, Aldershot, will shortly vacate this position and return to half-pay.

Major G. H. Younge, Major M. T. Yarr, Major C. E. Nichols, and Lieutenant T. B. Unwin have returned from South Africa.

INDIA AND THE INDIAN MEDICAL SERVICES.

On the termination of his duties as Plague Medical Officer in the Sialkot and Gurdaspur Districts Captain P. St. C. More was appointed to officiate as Civil Surgeon of Guzerat.

ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Lieutenant J. H. P. Graham to be Surgeon-Captain. Dated Sept. 4th, 1901.

VOLUNTEER CORPS.

Artillery: 1st Cumberland: Surgeon-Lieutenant I. C. Hodgson resigns his commission. Dated Sept. 7th, 1901.

Rifle: 5th (the Hay Tor) Volunteer Battalion the Devonshire Regiment: Surgeon-Lieutenant J. L. Cuppaidge to be Surgeon-Captain. Dated Sept. 7th, 1901.

VOLUNTEER INFANTRY BRIGADE.

Forth: Surgeon-Major J. A. Gray, 5th Volunteer Battalion the Royal Scots (Lothian Regiment), to be Brigade-Surgeon-Lieutenant-Colonel on appointment as a Senior Medical Officer to the brigade. Dated Sept. 7th, 1901.

MENTIONED IN DESPATCHES.

In the *London Gazette* of Sept. 10th the following names of medical officers are included in a list of "regimental officers, non-commissioned officers, and men of the Regulars, Militia, Yeomanry, and Volunteers, together with a few Irregulars and Civilians, who ..... have rendered special and meritorious service."

Grenadier Guards.—Surgeon-Major E. N. Sheldrake.

Coldstream Guards.—Surgeon-Lieutenant-Colonel J. Magill and Surgeon-Major W. R. Crooke Lawless.

Scots Guards.—Surgeon-Lieutenant-Colonel G. S. Robinson and Surgeon-Major W. C. Beevor.

Royal Army Medical Corps.—Colonel J. A. Clery, Colonel R. Exham, Lieutenant-Colonel T. R. Lucas, Lieutenant-Colonel F. A. B. Daly, Major S. Westcott, Major R. Kirkpatrick, Major R. J. Geddes, Major O. R. A. Julian, Major W. G. Macpherson, Captain S. G. Moores, Captain F. Smith, Captain H. J. Parry, Captain J. H. E. Austen, Captain E. M. Pilcher, Captain W. A. Ward, Lieutenant G. G. Delap, Lieutenant O. Challis, Lieutenant L. N. Lloyd, Lieutenant T. C. MacKenzie, and Lieutenant T. E. Fielding.

Indian Medical Service.—Major W. H. W. Elliott, First-class Assistant-Surgeon J. Moore, Third-class Assistant-Surgeon R. H. W. Hart, and Assistant-Surgeon F. de Santos.

Imperial Yeomanry.—Civil Surgeon H. A. Lowndes, Civil Surgeon H. Manders, Surgeon-Captain E. Hopkinson, Captain R. M. Wilson, Captain E. Davidson, Captain W. J. Naismith, Captain F. Welford, and Captain T. Walcot.

Elswick Battery (1st Northumberland Volunteer Artillery).—Surgeon-Captain J. Wreford.

The City of London Imperial Volunteers.—Surgeon-Captain R. R. Sleman (20th Middlesex Volunteer Rifle Corps).

Field Battery.—Surgeon-Captain A. Thorne, (2nd Middlesex Volunteer Artillery Corps)

Colonel Lumsden's Corps.—Surgeon-Captain S. A. Powell (Surma Valley Light Horse Volunteers).

New South Wales Army Medical Corps.—Major W. L'E. Eames, Honorary Major A. MacCormick, Lieutenant B. J. Newmarch, Lieutenant J. A. Dick, and Lieutenant A. H. Horsfall.

Civil Surgeons.—Dr. W. H. Brodie, Mr. G. Carré, Dr. S. E. Denyer, Mr. Engelbach, Dr. E. T. E. Hamilton, Dr. T. Kay, Dr. R. O. Moon, Mr. Perkins, Mr. A. Ricketts, Dr. A. E. Stevens, Mr. Willis, and Dr. Smart.

Irish Hospital.—Mr. G. Stoker, Dr. Colman, and Captain W. T. Mould, R.A.M.C.

Yeomanry Hospital.—Mr. C. Stonham, Dr. Green, Dr. Evans, Dr. Sheen, and Major G. E. Hale, D.S.O., R.A.M.C.

Langman Hospital.—Mr. C. Gibbs and Dr. H. Scharlieb.

Welsh Hospital.—Sir John Williams, Bart., Mr. Lynn Thomas, and Mr. R. H. Mills-Roberts.

Princess Christian's Hospital.—Major H. B. Mathias, D.S.O., R.A.M.C.

Edinburgh Hospital.—Dr. F. D. Boyd.

Scottish National Hospital.—Deputy-Surgeon General H. Cayley.

Portland Hospital.—Dr. J. E. G. Calverley and Dr. S. C. Wallace.

Canadian Red Cross Society.—Lieutenant-Colonel G. S. Ryerson.

SOUTH AFRICAN AFFAIRS.

There has been a more than usual amount of activity of late in South Africa and the daily journals have had numerous military operations to chronicle which have been attended with results of a gratifying character, although these have been purchased at the cost of some hard fighting and numerous casualties. The defeat and complete capture of Commandant Lotter's force formed a severe blow to the Boers. The effect of the Commander-in-Chief's proclamation has so far been relatively small. There are a great many circumstances connected with the Boer forces in the field, besides the mystery about their supply of ammunition, which have never been satisfactorily explained or accounted for. We know all about our losses from disease, but next to nothing, for instance, about those of the Boers, which must, however, make up a large total in the aggregate in the two years since the war began. According to the last War Office return issued on Sept. 4th the total reduction from all causes of the British military forces through war in South Africa up to the end of last month amounted to 21,646. It would be extremely interesting and instructive to know what the total reduction of the Boer forces from all causes has been. It will be remembered that allegations were made some time ago about the hardship of sending Boer prisoners to India. The Secretary of State for War has since furnished the following conclusive statement of facts:—Three camps are occupied by our Dutch captives: Ahmednagar, where they arrived on April 24th; Bellary, which they have inhabited since May 4th; and Trichinopoly, where they were placed on June 4th. The average percentage of sickness has been 4·39, 2·42, and 3·35 respectively, and there has been only one death.

THE POST OF ADJUTANT-GENERAL OF THE ARMY.

Amid the changes which have been brought about by the new organisation is the transfer of Sir Evelyn Wood from the post of Adjutant-General to the Forces to that of the command of the Army Corps at Salisbury Plain and the succession of General Kelly-Kenny to the former appointment. Under the new scheme of decentralisation the office and functions of Adjutant-General at headquarters are no longer, perhaps, of the same importance and extent, but they are, and will always be, far-reaching and inclusive of every branch of the military service. Sir Evelyn Wood, in addition to his military qualities and reputation, knew all that was to be known about military and War Office administration and was a good practical man of business, and will consequently be missed for a time at headquarters. But his successor,

General Kelly-Kenny, C.B., has the credit of being an eminently fair-minded man and an excellent organiser and he certainly did sound work as a general in South Africa. So there is every reason to hope and believe that he will do all in his power to aid the army medical authorities in giving effect to the new War Office scheme of medical reform which is soon to appear as the outcome of the labours of Mr. Brodrick's committee on the subject.

WELSH HOSPITAL FUND.

The general committee of this fund have in hand a surplus of about £3800 which they have decided to distribute as follows: 1. £250 to be sent to each of the commanding officers of the three Welsh regiments now serving in South Africa, to be applied in purchasing extra clothing and comforts for the men of their regiments. 2. The remainder of the fund to be given in grants to the necessitous, wounded, and incapacitated soldiers of the Welsh regiments and Welsh Militia, volunteer, and Yeomanry regiments who have served in the war, and also to the widows and orphans. Any subscriber unable to approve of the above scheme may have 20 per cent. of his subscriptions returned on application to the honorary secretary, Mr. A. Hughes, 1, Hare-court, Temple, E.C.

SURGEON-GENERAL W. TAYLOR, C.B.

It is confidently expected that Surgeon-General Taylor, who is now Surgeon-General of His Majesty's forces and Principal Medical Officer in India, will succeed to the post vacated by Surgeon-General Jameson at the headquarters of the army as Director-General of the Army Medical Service. If all that is rumoured about the beneficial changes which are to be introduced into the Army Medical Service be true the new Director-General will be called upon to administer an Army Medical Service under much improved conditions and happier auspices than have hitherto been the case. We may take this opportunity of congratulating Surgeon-General Taylor on being appointed one of the honorary physicians to the King.

CURRENT LITERATURE BY MEDICAL OFFICERS OF THE FRENCH ARMY.

The Comité Technique de Santé have decided to publish every month in the *Archives de Médecine et de Pharmacie Militaires* a descriptive list of the scientific works that have been submitted to it for examination by military medical officers. The first of these lists appears in the *Archives* for August and comprises the contributions that were examined during June last. 19 papers were sent in by 17 officers of various ranks, the subjects treated of being referable as follows:—Surgery, seven; medicine, five; hygiene, two; vaccination, two; toxicology, one; pathology, one; horticulture, one.

THE SICK AND WOUNDED OFFICERS AND NURSES.

In letters addressed to the press Georgina Lady Dudley and the Lord Mayor of London unite in an appeal for contributions to Lady Dudley's Fund for the relief of sick and wounded officers and nurses. Up to the present there have been placed in Lady Dudley's hands £37,221, of which £35,840 have been expended. Hence the necessity for an appeal to the benevolence of the public who, it is to be hoped, will respond liberally. At the present time the Fund has under its care 160 officers and a number of nurses.

DEATHS IN THE SERVICES.

Brigade-Surgeon Thomas Young Baker, Army Medical Staff (retired), in London on August 21st. Brigade-Surgeon-Lieutenant-Colonel James Byers Thomas, late Madras Medical Department, at his residence in Sandown, on Sept. 1st, aged 60 years.

SALISBURY INFIRMARY.—The annual meeting of the governors of the Salisbury Infirmary was held on August 29th. The 135th report which was presented stated that the expenditure of the institution during 1900 had exceeded the income by £721, and that the total deficit now amounted to £2095. The medical report showed that during the year 910 in-patients had been admitted, an increase of 29 as compared with 1899. 1173 out-patients and 1265 casualty cases had been treated. The report added that a new nurses' home was being erected and furnished at an estimated cost of £7885, of which sum all except £1575 had been subscribed. The committee in conclusion made an urgent appeal for increased financial assistance, and unless this is forthcoming they will be compelled to close some of the wards for a portion of the year.

Correspondence.

"Audi alteram partem."

FACTORY GIRLS' COUNTRY HOLIDAY FUND.

To the Editors of THE LANCET.

SIRS,—I hear with the greatest regret from the headquarters of the Factory Girls' Country Holiday Fund that their money is now exhausted. The committee have sent away this year 2800 of the poorest London working girls, but some hundreds of girls, of whom many have been saving for months to pay what they can towards their holidays, are still waiting to go. Unless help be quickly forthcoming they must lose their one and only week or fortnight's holiday in the year. I am sure that many who are still enjoying their own holidays, or even those who have come back from them, will do what they can for the hard-working London girls. Subscriptions may be sent to the chairman, the Rev. E. Canney, or to the honorary treasurer, Mrs. M. A. Bedford, St. Peter's Rectory, Saffron-hill, London, E.C.—I am, Sirs, yours faithfully,

Sept. 9th, 1901. A. F. LONDIN.

AN IMPOSTOR.

To the Editors of THE LANCET.

SIRS,—At the request of my good friend and former pupil, Dr. Hugh Brown Currie, who has been pursuing a most exemplary career on behalf of his country in South Africa, I avail myself of your columns to make known to the medical public a most infamous use of his name recently perpetrated by an impostor hailing from Brighton in a letter to me. The letter was one of the usual plausible kind, of which I have received several in my day, appealing for immediate assistance to save the writer from starvation. He had been (so he said) at Johannesburg before the war in a very good practice which, of course, was entirely broken up by the declaration of war. He then drifted about a good deal and finally returned to this country in a penniless condition, and had been trying for a practice or even a post as a locum-tenent without success. The one thing the rascally writer did *not* know was that I had maintained throughout the war a correspondence with the true Hugh Brown Currie and knew of his many noble deeds as a civil surgeon from Elandslaagte and Dundee onwards; and further that I had a letter from him on my desk, dating from South Africa, at the very time this scoundrel was personating him from Brighton. The police who were informed of the facts just failed to catch him, as he had absconded before they could get on his track; they informed me, however, of a few facts about him which they had not been able to make available for the above reason. I may add that there is only one Hugh Brown Currie in the Medical Register and that anyone who may be accidentally led to have any suspicion as to the impostor will do a real service to the public by placing what he may happen to know at your disposal or mine. The story told had so many points of *vraisemblance* that I should probably have been taken in for a time had it not been for the happy accident above adverted to. I have no doubt that the writer had been, as he said, at Johannesburg and in a position to know some of the facts.—I am, Sirs, yours faithfully,

Edinburgh, Sept. 3rd, 1901. W. T. GAIRDNER.

WORKHOUSE NURSING.

To the Editors of THE LANCET.

SIRS,—There is an old proverb that "Outsiders see the most of the game," and on that ground I venture to trouble you with a letter on the subject of workhouse nursing. I suppose that it will scarcely be denied that, theoretically at all events, trained nursing is the only form of nursing which should be found in any hospital, whether workhouse or general. Certainly to no general hospital would the public subscribe a penny if the nursing staff were not properly trained. Complete restoration of the sick patient to health

at the earliest possible moment is the object of all nursing. The practical difficulty of finding trained nurses willing to exercise their profession in workhouse infirmaries is, I think, the chief reason why every workhouse infirmary or at any rate why the majority of these institutions are not at the present moment fully staffed with trained nurses.

For some time past I have been closely studying the possibility of providing trained nursing throughout the Poor-law institutions and have come to the conclusion that there is not sufficient opportunity for training a sufficient number of nurses in the present institutions. Only about 10 per cent. of the provincial infirmaries of the present time are of a sufficiently large size (200 beds as a minimum) to give the requisite experience to the probationers, though a far larger number train, or try to train, on a far smaller number. The remaining 90 per cent. of the workhouse infirmaries are in great part very small. Some 67 per cent. contain on an average less than 45 patients. Not only is it impossible to train nurses in these small places, but it is impossible to keep up a staff of trained nurses in them. This is a matter of common knowledge, and due partly to the monotony of the life, partly to the infirmaries being within the workhouse walls, and partly to causes connected with the want of accurate knowledge, to put it mildly, on the part of boards of guardians as to the conditions under which trained nursing can alone be carried on. The provision of training schools in sufficient number and of sufficient size, complete separation of the sick part of the workhouse from the repressive part, and the adoption of measures which will have been found best to retain well-trained nurses for a considerable period in general hospitals and in other parts of the Poor-law service must, therefore, be generally adopted if the throwing away of the ratepayers' money upon an inefficient and wasteful system is to cease.

A long study of the relative position of workhouses as they lie scattered about England and the distribution of the patients in each has convinced me that the infirmaries may be reduced to between one-fourth and one-fifth of the present number without obliging the sick to be carried, or the friends or guardians to have to travel, an undue distance from their own unions. This reduction in numbers would cause a considerable increase in the number of infirmaries large enough to be utilised as training schools without being of unwieldy size, that is, between 200 and 500 beds. It would almost entirely do away with the small infirmaries—the crucial difficulty. Economically, it would do away with a considerable number of nurses and it would reduce very considerably the expense of maintaining so many different establishments as at present—at least, so far as the sick part is concerned. The institutions would then be capable of supplying their own vacancies with their own probationers and of having a large surplus of trained nurses for other purposes. The other purposes would be the supply of trained nurses to those smaller institutions, from 100 to 200 beds, which were sufficiently modern and well managed to make it possible to nurse properly in them. Again, the acutely sick, who could only be removed to the nearest union, would be attended to by a trained nurse sent down from the surplus staff of the larger institution to which it sent its patients. There would be a few isolated and very small infirmaries which would also be dependent on these large institutions, and as the infirmaries found in Wales are, with two exceptions, too small to train and too isolated to be abolished they would also be dependent upon the surplus staff.

This scheme is, therefore, a union of unions; but instead of those being isolated from one another they would be all united together by the aid of a central body, who would be charged with the duty of keeping up the standard, acting as intermediary, and, like a guard ship, retaining the names of those nurses on the books of the service while they were on leave, or, as a temporary measure, while they were on a central list to which the guardians could apply for nurses to fill vacancies. The saving in the cost of advertisements alone by such a list would be very large.

Finally, the attractions which will have to be held out—firstly, to suitable women to enter as probationers, and secondly, to trained nurses to remain in or to enter the service—will have to be very much increased if the services of these women are to be obtained in reasonable numbers. With this brief sketch of the remedies I suggest,

I am, Sirs, yours faithfully,

F. R. HUMPHREYS, L.R.C.P. Lond.

Fellows-road, N.W., August 29th, 1901.

THE COMING ELECTION TO THE GENERAL MEDICAL COUNCIL.

To the Editors of THE LANCET.

SIRS,—May I venture to ask you to do me the favour of allowing me to announce that I mean again to be a candidate for the post of Direct Representative for Scotland in the General Medical Council? On a future occasion I hope to be able fully to explain my views on current medical topics to the Scottish profession who have hitherto so handsomely trusted their interests in the Council to my hands.

I am, Sirs, yours faithfully,

WILLIAM BRUCE, M.D., LL.D. Aberd.

Dingwall, Sept. 7th, 1901.

"THE PATHOLOGY AND TREATMENT OF FIBROID TUMOURS OF THE UTERUS."

To the Editors of THE LANCET.

SIRS,—In your able leading article on the above subject in THE LANCET of August 31st, p. 602, you mention me as giving liquor strychninæ in three-minim doses thrice daily in order to avert shock and heart failure. Permit me to point out what is, in my opinion, most important—viz., that the dose should be administered *hypodermically*. Since adopting this treatment I have performed 82 consecutive hysterectomies without a death.

I am, Sirs, yours faithfully,

Harley-street, W., August 31st, 1901. WILLIAM DUNCAN.

BERMONDSEY SETTLEMENT.

To the Editors of THE LANCET.

SIRS,—At this time of the year, when many medical students are coming to London, I venture to ask if you will allow me to call attention to the fact that we have a few vacancies for residents at the Bermondsey Settlement, Farncombe-street, Jamaica-road, S.E.? The Bermondsey Settlement, established for carrying on social work among the poor by university men and others, is conveniently situated for Guy's, St. Bartholomew's, and the London Hospitals. Residence here enables medical students to obtain considerable insight into many of the social problems affecting the poorer part of the population, without involving too great distraction from medical studies. Indeed, Professor Macalister, some time ago, speaking on behalf of this settlement, called attention to the important advantages which medical students might derive from residence in such an institution. Our appointments are good and our terms reasonable, and I should be glad to supply further information to anyone who may write to me.

I am, Sirs, yours faithfully,

J. SCOTT LIDGETT,

Sept. 10th, 1901. Warden of the Bermondsey Settlement.

IRISH SURGICAL QUALIFICATIONS.

To the Editors of THE LANCET.

SIRS,—The following letter, signed "Erinensis," has appeared in two of the leading Dublin papers:—

At a time when so much discussion is being provoked over hospital appointments in England as to the relative merits of the higher qualifications in surgery of the Colleges of the United Kingdom it is, indeed, gratifying for Irishmen to recall the fact that the Royal College of Surgeons in Ireland is the only surgical corporation which is bound by its charters and by-laws to carry out a public examination for Fellowship.

Amongst other provisions it is expressly laid down by the Royal Charters of 1844 and 1885 that a candidate for the Fellowship of our Irish College must be examined "in the presence of the President or Vice-President, and two members of Council." The carrying out of such a provision must effectually silence those critics who would deny the high standard of examination for the F.R.C.S.I., and who endeavour to exclude holders of such qualification from the higher hospital appointments of England, as being of an inferior professional standing to the Fellows of the surgical colleges in England and Edinburgh.

If the writer of this letter be correct in his statement that the Irish College of Surgeons alone possesses this safeguard to collegiate integrity it must considerably enhance

the value of the F.R.C.S.I. Perhaps some of your readers might care to confirm or deny the accuracy of "Erinensis."

I am, Sirs, yours faithfully,

Dublin, Sept. 7th, 1901. S. WESLEY WILSON.

THE CONTAGION OF TUBERCULOSIS.

To the Editors of THE LANCET.

SIRS,—Anything which throws any light on the probable sources of infection or contagion of tuberculosis is just now of interest to the medical profession, hence my reasons for reporting the following circumstances. I was called about six weeks ago to attend a child, about 14 months old, whom I found to be suffering from tuberculous disease of the bowels; it had been quite healthy and strong up to the beginning of May, when it commenced to suffer from diarrhœa and to lose flesh. The parents thinking it due to teething did not call me in until they became alarmed at its general appearance. The parents are both strong and healthy, as well as are three other children, aged about six, four, and two and a half years respectively, and there is no history of phthisis in the family. The patient is a typical "marasmic child." Quite by accident I discovered the following circumstances connected with the milk-supply. Last February a new tenant came into the farm where my patients have obtained their milk-supply for years and which is next door (about 200 yards away), whose wife, aged 36 years, has milked the cows and daily night and morning delivered milk in a separate vessel at my patients' house; the separate vessel had been used as the house is not in the milk round; all the rest of the milk had been taken straight away to a large town for delivery. On visiting the house last Sunday I was told that the farmer was in trouble, as his wife, who had been ailing ever since they came, was in bed with phthisis and could not recover. Here is a member of a perfectly healthy family (as far as can be ascertained) developing tuberculosis after drinking milk which has been handled by a dairymaid suffering from tuberculosis. I state these facts simply for what they are worth and leave your readers to form their own opinion upon them, and if any of them are making any investigations on this subject and would like more details I shall be glad if they will communicate with me.

I am, Sirs, yours faithfully,

Victoria-park, Shipley, Sept. 3rd, 1901. D'ARCY B. CARTER.

"LEGISLATION AGAINST NATIONAL INTEMPERANCE."

To the Editors of THE LANCET.

SIRS,—My note in *Nature* (August 8th) was intended to draw the attention of biologists, as such, to this question, not a purely medical one, which has been advocated somewhat too strenuously on one side by some of your correspondents. They have been driven back upon a time-worn biological line of defence, the "non-proven" doctrine of Weismann, and there "left fighting" in a somewhat languid manner. It seemed desirable that the *venue* were changed and some expression on the purely biological basis of this discussion were given. Hence any lack of controversial directness on my part. I hope I have not misunderstood the tenor of this correspondence when I ask—(1) Have there not been two contrary opinions maintained throughout as to the expediency of legislation against national intemperance, the opinion of one side being based upon the impossibility of effectual legislation? (2) Have not the two parties expressed or implied directly opposed views as to the import of alcoholism—one that it is a selective agent in the improvement of a stock of a nation by its weeding-out processes, and the other that alcoholism is only evil from the national point of view, and that continually, and largely because of its effect upon the offspring of drunkards? and (3) Has not the ultimate justification for disregarding the last point rested upon Weismann's doctrine?

Dr. Reid asks me who stated that "alcoholism was a selective agent of value in the evolution of man which ought not to be interfered with by legislation," and then tells us he stated that it *could* not be interfered with. May I ask him, has he not the courage of his own convictions, and will he not allow that, if it cannot be interfered with, it ought not to be interfered with? And, further, does he not consider alcoholism a valuable selective agent? If he does, it does not follow that he holds the "atrocious doctrine" to which he refers, but certain other rather serious consequences are involved. Not having access to my copies of THE LANCET containing this correspondence I cannot do more than refer to my recollection that there have been "advocates of the view that alcoholism is a selective agent of value." Dr. Reid may not be one of them. As to the technical point in "Hair on the digits of man" I did not challenge Dr. Reid to refute me; I referred him to it as the protagonist of the extreme Weismannian position, as I asked the biologists in *Nature*, to consider it on its merits. How comfortable it would be to be so sure, either way, as Dr. Reid is when he can say, "Doubtless man is the child of the monkey." But we may at any rate assume that it is so for present purposes. The passage beginning "its descendants" and including the two following lines is difficult to follow and contains a mis-statement which perhaps is an oversight. The monkey has *not* worn down the hair on its ungual phalanges more than man, but a good deal less on these and all phalanges of foot and hand. I have never heard of anyone who has satisfactorily explained how it is that the man has lost most of his hairy covering and it has been looked upon as rather a *crux* for the evolutionist. But one may assume, for the sake of argument, that the monkey has retained his because it suited his requirements.

The only indication I can see of any refutation of my suggested Lamarkian interpretation of a particular fact is the allegation: "The disappearance of hair on the ungual phalanges is only part of a general phenomenon." The inference is that, because "wearing-down" of hair on the phalanges is put forward as the only feasible interpretation for this area, one is bound to account for the disappearance of hair from the whole of man's body except from the head, face, armpits, and pubes, in the same way. In passing, one may note that it was a little incautious in Dr. Reid to mention the only four regions of the body where "wearing down" does *not* occur and in which hair is abundant and persistent. But I will not claim this from him—he may deal with it as he likes. My modest little contention is only part of a great theory held by eminent biologists which Dr. Reid on August 10th called "wildly incredible" and now considers to be a "hypothesis so wildly improbable" and endeavours to alarm one at one's own temerity in considering "that the wearing down of hair on the ungual phalanges so affects the germs situated in the far-distant testicle or ovum that the organisms which spring from them tend to reproduce the peculiarity the parent acquired." It is no more deserving of scorn in this than in the greater cases seriously held as parts of a great whole which desires from selection no more than to "live and let live." Much more has yet to be learned and said as to the bearing of hair-direction on this much-debated doctrine.

I am, Sirs, yours faithfully,

August 24th, 1901. WALTER KIDD.

"HARVEST BUGS."

To the Editors of THE LANCET.

SIRS,—I notice that some of your correspondents are interested in the matter of "harvest bugs," and as I have had personal experience of their blandishments my account may be not without value. Some years ago in the island of Grenada, West Indies, and the month November, being neither "in the know" nor cautioned, I spent a forenoon writing letters, sitting at a table on the grass under a tree, and wearing trousers and thin socks, but no "pants." The next day I was sorely troubled with itching all over the legs, particularly about the ankles; a few days later my whole body except face and hands was covered with minute pimples, or papules, which itched distressingly. This lasted for many days; I used to get a friend to rub me hard with the roughest towel procurable, and a considerable quantity of clear, probably serous, liquid came from the papules when the tops were rubbed off. I lost several nights' sleep and was feverish, and in fact far from well. I found the insect on my body and was told that it was well known in the island and was called the *bête rouge*. It was also pointed out to me actually hanging in great clusters of red colour from the noses of mules. I took specimens and on my return home made preparations of them and then identified them as harvest bugs (*Trombidium autumnale*).

Those I have are, I think, young, and have six legs, three on each side, and all springing from near the "shoulders." At the end of each leg they have a tuft of extremely fine sickle-shaped claws with which they presumably cling to their victim while they insert into the skin some sharp lancets which I see on the head. The colour is a rusty red, which was very well seen in the clusters already mentioned. A specimen which I have photographed gives at 70 diameters of magnification the following dimensions: from end to end, one and one-third inches; across body at broadest part, one inch; from claw to claw of the middle legs extended, one and a half inches. The middle legs are shorter than the other two pairs. In Dr. Radcliffe Crocker's "Diseases of the Skin," 1888, at pages 695, 696, I find the insect very well described and figured, but in my specimen the claws are more distinctly hook-shaped, and the tarsus on which they grow is more distinctly differentiated from the next portion of the leg. Dr. Crocker uses the name *Leptus autumnalis* which is also used by other authorities.

I am, Sirs, yours faithfully,

Bexley Heath, S.E., Sept. 10th, 1901. ANDREW PRINGLE.

To the Editors of THE LANCET.

SIRS,—Since writing my letter of August 27th, which you were good enough to publish in THE LANCET of August 31st, p. 616, I have been consulted by a lady for a dermatitis of the lower extremities due to the irritation of the harvest bug. The irritation, with formation of wheals, &c., began early in July. It is stated by some observers (Dubreuilh) that the parasite attaches itself to the base of a hair. I looked for it with the greatest care, but failed to find the acarus. This may be accounted for by the fact that applications had been used. The time to look for it would be when the animal starts its feeding operations. It does not burrow in the way that the acarus scabiei does; it introduces its head only into the skin. Being very minute it must, of course, be sought with a lens.

As to the districts and soils infested by the harvest bug, my patient came from a place situated between the South Downs and the sea (chalky soil). Many years ago, I was when a lad attacked about the legs. This was on Jura limestone soil (oölite) near the sea.

There are evidently different varieties of the creature, varying slightly in hue, some shade of red. It is described as brick-red, bright scarlet, rouge orangé, and dull red like cayenne pepper. In France it is called, in addition to *rouget*, *vendangeur*, and according to Besnier it prevails in large numbers in the central and western parts of France. Therefore its distribution is wide and it is not necessarily found only near the sea. In Germany, in addition to *Erntemilbe* it is called *Grasmilbe* (grass mite). There is an interesting passage in Gilbert White's "Natural History of Selborne" with reference to the parasite: "There is an insect with us, especially on chalky districts, which is very troublesome and teasing all the latter end of the summer, getting into people's skins, especially those of women and children, and raising tumours which itch intolerably. This animal (which we call a harvest bug) is very minute, scarce discernible to the naked eye, of a bright scarlet colour, and of the genus *Acarus*. They are met with in gardens on kidney beans or any legumens, but prevail only in the hot months of summer. Warreners, as some have assured me, are much infested by them on chalky downs where these insects swarm sometimes to so infinite a degree as to discolour their nets and to give them a reddish cast, while the men are so bitten as to be thrown into fevers." (Letter XXXIV., Pennant Series.)

Strictly speaking, the harvest bug is not an insect, but a member of the Arachnida. The German *Milbe* is therefore more apposite. It probably got the name of bug from its colour. Wood states that it is especially plentiful about French beans and is also found in stubble-fields.

In conclusion, I should be glad to receive a few specimens in a phial, properly corked.

I am, Sirs, yours faithfully,

Upper Gloster-place, N.W., Sept. 9th, 1901. GEORGE PERNET.

To the Editors of THE LANCET.

SIRS,—Here in Devon this little pest is supposed to inhabit the raspberry canes, but this origin may have been assigned to it to protect the luscious fruit from children, who dread its bite. I have never found it there, nor on anything taller than grass, but fruit-pickers certainly suffer much from its bite. Lying on grass is, in my experience, the commonest cause of "infection" with children, whom I have seen a mass of itching spots from the neck downwards after a day spent in play on a sunny tennis-lawn. It does not seem to trouble men in trousers, and tourists who don knickerbockers often make its acquaintance for the first time and are thereby much alarmed. Almost any one of the essential oils is a prophylactic, and so is carbolic soap frequently applied, or carbolic oil, but this treatment is almost as bad as the disease. I do not think that they bite those persons who have lately bathed in the sea, so that salt water may be a protection. Children rarely suffer if they are prevented from sitting on short grass or playing in long grass. It is killed by the same means as the itch acarus, which it somewhat resembles in size, shape, and method of attack, but not in colour. Balsam of Peru is useful, I believe, and a lotion made of liquor carbonis detergens is better, but there is nothing that gives such immediate and effective relief as a little sulphur ointment rubbed into each itching spot. Vaseline, as suggested by Mr. Armstrong in his interesting letter, does not stop the itching and the consequent scratching, so hurtful in children.

I am, Sirs, yours faithfully,

Ilfracombe, Sept. 7th, 1901. O. CLAYTON-JONES, M.B. Oxon.

ROYAL MASONIC INSTITUTION FOR BOYS.

To the Editors of THE LANCET.

SIRS,—May I call the attention of medical Freemasons to the case of Reginald Everard Adolphe Webster, aged 10 years and nine months, who is a candidate for election to the Royal Masonic Institution for Boys in October? He is the second son of the late Mr. George Leonard Webster, M.R.C.S. Eng. and L.S.A., P.M. Lechmere Lodge, No. 1874, a member of the Addiscombe Lodge, No. 1556, and life subscriber to the institution, who died from acute pneumonia after a brief illness, leaving a widow and four children practically unprovided for. It is important that every effort should be made to secure the candidate's election in October, as it is his *first, last, and only chance*. I will thankfully receive and faithfully apply any voting papers which may be sent to me, or they may be sent to Brother J. D. Langton, 2, Paper-buildings, Temple, E.C.

I am, Sirs, yours faithfully,

JOSEPH POLLARD.

51, Queen Anne-street, W., Sept. 7th, 1901.

"THE USE OF A LINEN BAG IN ETHER ANÆSTHESIA."

To the Editors of THE LANCET.

SIRS,—Will you kindly correct an error which appeared in the note of cases I gave? These should read: nephrotomy, 45 minutes; appendectomy, 40 minutes; ovariotomy, 48 minutes; gastro-enterostomy, 40 minutes; exploratory incision and colotomy, 35 minutes; breast amputation, 45 minutes. One hour extra appeared by mistake. The average time per ounce was, however, right. I ask this correction in justice to the operator, Mr. Mayo Robson, who is a rapid worker.

I am, Sirs, yours faithfully,

W. MCGREGOR YOUNG, M.A., M.D. Glasg.

Leeds, August 31st, 1901.

"THE ELECTROLYTIC TRANSMISSION OF SULPHUR."

To the Editors of THE LANCET.

SIRS,—In reply to Dr. Longridge's comments upon my article I beg to say that my "discovery" is this—viz., that by passing a constant current of electricity through the Harrogate sulphur water nascent sulphur is thrown down from the sulphuretted hydrogen gas in the water, that it can be deposited upon a patient's skin when having a bath, that it penetrates the skin and enters the circulation, and that the benefit derived in eczema, gout, rheumatism, and peripheral neuritis is much quicker and greater than by the patient simply lying in an ordinary bath of sulphur water without electricity. I never heard of Mr. E. Savary de Rovigo or

his methods till I saw his name in THE LANCET of August 24th. My "discovery" so far as the Harrogate sulphur waters are concerned is quite original.

I am, Sirs, yours faithfully,

Harrogate. FRANCIS WM. SMITH.

"THE SALARY OF A MEDICAL OFFICER IN THE HIGHLANDS AND ISLANDS."

To the Editors of THE LANCET.

SIRS,—The attention of our client Dr. Donald Lamond, recently medical officer of the parish of Lochbroom, has been called to your issue of the 17th inst., in which you comment on the advertisement for a successor to him in that office. You copy the advertisement from the *Glasgow Herald* and state that you "do not recommend any medical man to apply for this vacancy without making full inquiry *from the previous medical officer* as to the work to be done." At the beginning of your note you state that the advertisement had been *sent to you* for comment and you close your comment by saying, "*We are informed* that the salary is totally inadequate."

From the terms of your remarks it is clear that some person with more than an outsider's knowledge of the appointment has sent the advertisement to you, and from your reference to the "*previous medical officer*" it might be inferred that our client was your informant. Our client regrets very much that you should have connected him in any way, however indirectly, with a paragraph the object of which is clearly to prevent the vacancy being filled up and he feels that he owes it to the parish council that he should ask you to make it quite clear in your next issue that your comments were not suggested by him.

We have advised our client to send a copy of this letter and of your reply to the Lochbroom Parish Council in case their attention may be drawn to your note and we shall therefore be obliged by your stating explicitly in your reply to us that our client *was not* in communication with you as to the advertisement and that your comments were in no way suggested by him.

We shall be glad to hear from you.

We are, Sirs, your obedient servants,

Edinburgh, August 29th, 1901. CAMERON AND ORR.

*** We have pleasure in publishing the above communication and in confirming the statement of Messrs. Cameron and Orr that their client was not in communication with us as to the advertisement. Our correspondent in the matter was perfectly well informed and our warning that no one should apply for this vacancy (or similar vacancies) without making inquiry from the previous medical officer is one that we very usually give. The fact that Dr. Donald Lamond happened to be the previous medical officer was an accidental circumstance.—ED. L.

NOTES FROM INDIA.

(FROM OUR SPECIAL CORRESPONDENT.)

Further Increase in Plague Mortality.—A Year's Work of the Pasteur Institute at Kasauli.—The Health of Assam.—Enteric Fever in the British Army.

THE rise in the number of plague deaths throughout India during the past week is very decided. For the week ending August 10th 2618 deaths were recorded, against 2003 in the preceding week and only 285 in the corresponding week of last year. The figures are: Bombay districts 2198 (especially Dharwar districts), against 1730; Bombay City 159, against 136; Mysore State 209, against 109; Calcutta 17, against 11; and Bengal 10, against 4. These figures show that the disease is slumbering in Bengal but active again in Bombay. The City of Hubli in Dharwar district is again attacked. It will be remembered that over two years ago plague ravaged this city very severely and that during the outbreak an enormous majority of the population were induced to undergo inoculation. Its comparative absence during the interval is strong evidence in favour of inoculation. Notwithstanding the adverse recommendations of the Plague Commission train inspection of all passengers from the Southern Mahratta Country has been re-instituted at Poona. Sporadic cases continue in Karachi and in Poona. In Bombay city there has been a steady rise for several weeks and the rate of mortality has been going up out of all proportion to the reported increase of plague. The death-rate at present is recorded as 50·72 per 1000.

The Pasteur Institute at Kasauli completed its first year's work on August 8th. The total number of patients has been 321—namely, 146 Europeans and 175 natives. There has not been a single failure in the treatment among the Europeans and only two amongst the natives. In the latter cases the patients had been severely bitten and arrived late for treatment. The saving to the Government must have been considerable, as no British soldiers have been sent to Paris. The animals which inflicted wounds were dogs (the great majority), jackals, wolves, foxes, cats, ponies, and mules. In a large number of the cases the animals were experimentally proved to have had rabies, a portion of brain and spinal cord being sent to the institute to be tested. In other cases the animals were certified as rabid by veterinary surgeons. Many who were bitten by the same animals but did not come up for treatment died. None of the patients were upset by the treatment or ill in any way. The record therefore is better than that of any similar institution in the world. At Cawnpore only a few days ago a mad jackal ran amok and bit 11 men amongst the 11th Rajputs and seven men and seven followers of the 5th Bengal Cavalry. The whole party have been despatched to Kasauli.

Assam has always had a bad reputation for unhealthiness. This is not borne out by the sanitary reports for the province. The death-rate last year was 30·64 per 1000, as compared with 31·34 for Bengal. There is a low death-rate from fever and even where the fatal kala azar abounds it was only 12·07, against 22·98 for all Bengal. In previous years, however, it has not been quite so good. The deaths from kala azar have steadily declined from 18,597 in 1897 to 9012 in the year under review.

The health returns of British regiments in India continue to show a remarkable decline of enteric fever during the current year. It is important to remember that the garrisons consist at the present time mostly of seasoned soldiers, while only very small drafts have been received from England since 1899. This must be taken into account in comparing with past years and in estimating the probable value of sanitary improvements. We must await the advent of young soldiers to prove the value of the sanitary works effected during the past two years.

On the recommendation of the Director-General, Indian Medical Service, the Government of India is distributing among civil surgeons and other medical officers the work "Malaria according to the New Researches" by Professor Angelo Celli of Rome.

Bacteriological work is being started at several new places. The Port Commissioners at Rangoon propose building and equipping a laboratory chiefly at first for the examination of suspected plague. The Government of the Malay States has recently established a Research Institute open to all workers irrespective of nationality. Pathological work, original chemical research, as well as bacteriological investigations will be open to all. It is time that laboratories on a similar scale were started in some of the chief cities in India.

August 16th.

Preventive Inoculation for Rinderpest.—Famine Relief.—The Health of the Three Presidential Cities; Sanitary Improvements in Calcutta.

THE prevalence of rinderpest in Bengal has given excellent opportunities to the Veterinary Department to test preventive inoculation of cattle. There are two methods in use—the single and double. The single, or plain serum method, consists in injecting a certain quantity of serum under the skin. This does not produce any reaction and the animals are able to be kept at work. The natives raise no objections to it and the operation is sufficiently simple to trust a veterinary assistant with it. The great disadvantage is that the protection afforded only lasts a short time, although the immunity may extend throughout an epidemic. Even when it fails to protect completely it may be sufficient to prevent the death of the animal. The double method, consisting of an injection of serum on one side and an injection at the same operation of virulent rinderpest blood on the other side of the animal, possesses the advantage of conferring immunity for several years. On the other hand, it has many disadvantages. The native objects to the taking and using

of rinderpest blood, and the animal subsequently developing an attack of the disease is a focus of contagion because the people will not isolate it. Again, if the animal is commencing to sicken for rinderpest the injection will almost certainly kill him. The process throws the animal out of work and consequently involves an expense to the owners. Lastly, it is an operation which can hardly be trusted to veterinary assistants. It has been decided, therefore, in Bengal to push the single serum method and to employ that alone. Experiments show that the dose hitherto given has been too small but the results of inoculations have been distinctly beneficial.

Notwithstanding the rains there are still about half a million people receiving famine relief and while the numbers have decreased in some districts they have actually increased in others.

The two Presidential Cities of Madras and Bombay show very high death-rates. In Madras the mortality has been going up during the past few weeks by leaps and bounds and now stands at the rate of 91·2 per 1000 as compared with the mean of 54·3 for the past ten years. Fevers, dysentery, cholera, and diarrhœa in the order named are the chief diseases. In one district of the city the death-rate was actually 163·6 per 1000. In Bombay city also the mortality has been rapidly rising and now stands at the rate of 58·41 per 1000. Plague is rapidly increasing in severity and the deaths last week were 197. Relapsing fever is again more prevalent and also diseases of the respiratory organs. No one can help thinking that plague is more prevalent than the returns indicate. In Calcutta, on the other hand, the death-rate is exceptionally low. There is no sign of recrudescence of plague and the deaths from this disease are only about a dozen a week. There is great activity in the Plague Municipal Departments towards remodeling the numerous insanitary bustis, and the governing city authorities are taking up a very firm attitude to compel the owners of property to improve these areas. Several busti grounds, especially in the European quarter, have already been cleared and it is to be hoped that before long the remainder will be cleared also. A constant water-supply for the city is being arranged for, some open squares are to be formed in the northern crowded districts, and many other improvements are in contemplation. Calcutta is evidently waking up to its sanitary shortcomings.

August 24th.

MANCHESTER.

(FROM OUR OWN CORRESPONDENT.)

Pollution of the Ship Canal.

ONE almost begins to pity Manchester and Salford for the perpetual worry which they have over their sewage and the pollution of the Ship Canal. The Joint Committee charges Manchester with adding to the pollution of the canal and Salford is threatened with proceedings before Judge Parry. Mr. Gilbert Fowler, chemist to the Manchester Corporation, "is anxious to mitigate the intolerable stench," but does not think that any addition to the present chemicals will perceptibly increase the purity of the effluent from their works. The most practical suggestion seems to be that the new filter-beds should be constructed as fast as possible. Two of the bacteria-beds, each half an acre in extent, are completed and are working satisfactorily, while 10 more are being rapidly pushed forward. Moreover, 13 acres of stormwater filter-beds are begun, the capacity of the present settling tanks is being increased, and about 14 more acres of filter-beds in addition are to be made. But the misfortune is that all this will not diminish the nuisance produced above Barton Locks, which "will be unaffected by any improvement in the Manchester effluent." No great diminution of the nuisance in the Manchester portion of the canal will be effected till the Irwell is purer above the city. The truth is that the filth of Manchester, as represented by its sewage, has, by ignorance and neglect up to recent times, grown into something so huge that the most strenuous and long-continued efforts will be needed before it can become properly controlled. To give some idea of the vast scale of everything connected with Manchester sewage the city surveyor states that 1700 miles of sewers in Manchester require ventilation. Suffering so much as they do from past neglect it behoves local authorities to see that they do not hand down unpleasant, not to say dangerous, problems to their successors.

Risk of Infection.

A somewhat curious case occurred recently in Salford. A man was fined 5*s.* and costs for permitting his child who was recovering from scarlet fever to be in the streets "to the danger of the public health." One of the sanitary inspectors of the corporation after visiting the case, which was reported to the Health Committee, was surprised to meet the defendant's wife with the child in company with another woman and a baby in a bassinette. She told him that the medical man gave her permission to take the child out but only while other children were at school, as he did not want it to mix with them. The practitioner was therefore aware of the risk and is reported to have said that the child was free from infection, though infection might linger for a long time in the clothing; and when asked if he considered his patient before the health of all the people in Salford the answer as reported was: "My duty is to cure my patient. The medical officer will look after the public health." This suggests one or two remarks. The practitioner knew apparently that the clothing might convey the disease. Is there no disinfection for clothing, &c., in Salford in the case of private patients? The exposure of the child in the streets was illegal or the father would not have been fined. Was the practitioner ethically right in telling the parents to commit an illegal act? Has a private practitioner no duties as regards public health, and is he at liberty to endanger it if he thinks that to do so may benefit his patient under the plea that it is not his business but that of the medical officer to "look after the public health"? It is, happily, a rare thing to find that a private practitioner conceives it to be his duty to do anything for his patient which will be a danger to the public.

The Drought.

The looked-for steady downpour required to bring the water-supply of Manchester to its normal condition has not come, and the last report was that there is now only sufficient water for 31 days. The consumption each day is about 30,000,000 gallons. In some of the districts water can only be obtained for four hours daily. At Middleton on Sept 5th the Mayor announced that they had usable water for 25 days only. A similar cry is heard from Bury, which has only 27 days' supply, and most of the towns in South Lancashire are in like straits. At this time last year Bury had 47 days' supply.

Unlabeled Poisons.

Mr. Smelt, the city coroner, made some sensible and much-needed remarks a few days ago on the dangerous practice of keeping poisons in unlabeled bottles. A woman had been drinking for several days and on Sept. 2nd she swallowed a large quantity of carbolic acid from a stone ginger-beer bottle. She died the next day and at the inquest Mr. Smelt expressed the hope that the attention of the Bottling Association or the owners of the bottles would be drawn to the case, because it was an offence to put poisons in these bottles. He understood that it was punishable by a £5 penalty and he hoped that it could be imposed in this instance. "It was nothing less than a trap to keep poison in bottles intended for drinking-fluids."

A Fragrant Suggestion.

A Salford alderman is credited with the following suggestion for bringing Blackpool, or rather some of Blackpool's salt sea, to the Salford public baths. The borough possesses a sludge steamer which carries four cargoes of sewage out to sea each week, and he suggests that sea-water should be brought to Salford on the return trips. Even if the residents should be willing to bathe in diluted sewage, which is extremely improbable, it is scarcely likely that the medical officer of health would sanction the scheme.

Sept. 10th.

LIVERPOOL.

(FROM OUR OWN CORRESPONDENT.)

The Liverpool School of Tropical Medicine: Return of Major Ronald Ross.

MAJOR RONALD ROSS landed at Plymouth on Sept. 2nd, and immediately proceeded to Liverpool, having hurried home to take up his appointment as sanitary commissioner

to the West African Commission. The present is the fifth expedition which the Liverpool School of Tropical Medicine has despatched to West Africa. Dr. Logan Taylor will remain on the coast for one year to carry out a series of experiments for the extermination of the mosquito in various districts. At the end of June the expedition arrived at Sierra Leone and entered upon the task of attempting to get rid of mosquitoes in Freetown. The party were cordially welcomed by the Governor, Sir Charles King-Harman, and other influential residents. Operations were started without delay, over 30 men being employed in the work. The Governor supplied 12 men and the necessary implements and carts. One gang was employed in destroying mosquito larvæ in houses and attached areas. This gang cleared 2473 houses in 34 days and removed 558 cartloads of broken bottles and tins, in which the culex mosquito breeds. Another body of men had been engaged in draining breeding-pools of mosquito anopheles, destroying the larvæ by means of oil. Major Ross is of the opinion that it is too early yet to speak emphatically, but the number of mosquitoes in the very centre of the town had certainly been largely reduced. There were hardly any to be found in Dr. Logan Taylor's house, where formerly they used to swarm. The same state of affairs prevailed at Government House, where Major Ross stayed with the Governor. Dr. McKendrick, of the Indian Medical Service, who had been deputed to watch over the operations of the expedition on behalf of the Government of India, had not been bitten once during the whole month. In former days he would certainly have been bitten at least five or six times a day. Leaving Dr. Logan Taylor at Freetown Major Ross proceeded to Lagos, where he was accorded a warm reception by the Governor, Sir William Macgregor, and Mr. W. H. W. Strachan. The Governor of Lagos was enthusiastic in seconding the efforts of those engaged in preventing malaria in Lagos, the measures adopted by him being admirable. At Accra, also, Major Nathan, the Governor, was anxious to start similar work, and doubtless experts will be sent out immediately by the Liverpool School. On the whole Major Ross expressed himself as being well satisfied with his tour. Scientific measures against malaria had been started all down the coast from Gambia to Lagos. Major Ross believed that by minute attention to various details the coast would be made as healthy as India for Europeans. Old West Africans were sober and careful and generally lived in good health. It was the improvident newcomer who generally came to grief. With four governors on the coast all anxious to improve the health of their spheres great results were to be expected. Dr. Logan Taylor, in a cablegram just received, stated that "5000 houses in Freetown have been cleared of vessels of every description that previously served as breeding-ground for mosquitoes. Work going on steadily. Have 50 native assistants employed."

The Liverpool Sanatorium for the Open-air Treatment of Phthisis.

The new sanatorium, which is a branch of the Liverpool Hospital for Consumption and Diseases of the Chest, was informally opened for the reception of patients on Sept. 9th. The sanatorium, which has been erected in the Delamere Forest, is situated in the midst of its own grounds of about 45 acres, amidst the healthiest of surroundings. The applications for admission are already very numerous, so many afflicted people being anxious to test the efficacy of pure air in aid of treatment. The parent institution in Mount Pleasant will be retained for the treatment of out-patients and as a hospital of observation for the selection of cases suitable for treatment at Delamere Forest.

The Lancashire Asylums Board and Asylum Accommodation: a New Asylum to be Erected.

A deputation from the Lancashire Asylums Board was appointed to interview the Commissioners in Lunacy and to urge that the committee of visitors for Winwick Asylum should be authorised to receive chronic harmless cases from workhouses without their being sent in the first instance to one of the other asylums belonging to the board. The question of the continued want of asylum accommodation in the county was again discussed at the last meeting of the board, when the following motion was carried:—

That it be an instruction to the Sites Committee to select a site for a new asylum for acute cases in addition to the one they are at present engaged on.

Donations to Liverpool Charities.

By the terms of the will of the late Mr. John Westmoreland of Huyton, near Liverpool, who died on July 17th last, the following Liverpool charities have received legacies: The Royal Infirmary, £250; the Hospital for Consumption and Diseases of the Chest, £250; the David Lewis Northern Hospital, the Royal Southern Hospital, and the Infirmary for Children, each £100.

The Royal Commission on Tuberculosis.

Among the newly appointed members of the Royal Commission to inquire into the subject of tuberculosis in relation to man and animals will be found the name of Dr. Rubert W. Boyce, professor of pathology in University College, Liverpool.

The Annual Report of the Medical Officer of Health.

The annual report of the medical officer of health (Dr. E. W. Hope) for 1900 occupies a quarto volume containing upwards of 200 pages. It is furnished with a map of the city with its subdivisions and with diagrams pointing out the incidence of disease and its various classifications. A noticeable feature of the report is the wide variation in the birth-rate and death-rate in different areas of the city. For instance, in the fashionable district of Sefton Park the death-rate was only 10·7 per 1000, as against that of Scotland Ward, which was as high as 36·5 per 1000. In the matter of the birth-rate the figures showed not quite so much variety, inasmuch as the Scotland district afforded a birth-rate of 40·8, exactly double that of Sefton Park, which was 20·4 per 1000, the lowest of the 11 districts contained in the city. A large proportion of the inhabitants sought the benefits of hospital treatment, as was evidenced by the number of deaths occurring in those institutions. It is satisfactory to find that cases of typhus fever are a diminishing quantity, the numbers being fewer than had ever been experienced during one year in the city, this happy result being ascribed to sanitary precautions. 731 cases of typhoid fever were reported, as against 988 in the preceding year, while the deaths were fewer by 62. The Notification of Infectious Diseases Act has done much to diminish the number of cases of scarlet fever, in which there was a progressive decline, centres of infection being removed by the deportation of the cases to the infectious hospitals. On the other hand, the unsatisfactory provision in hospitals for cases of diphtheria is to be deplored. The position in regard to alcoholism is difficult to explain. In many directions there was a decided improvement; other localities, on the other hand, are becoming worse. The diminution of the offence of overcrowding is noteworthy, owing to the supervision by the staff. Numerous investigations had been made during the year upon sewage disposal, and the sewage farm at West Derby, with its experimental bacterial beds, had proved of service. The special beds in connexion with the Fazakerley Fever Hospital are intended to sterilise the effluent after it has passed through the coke beds. The substitution of electric cars for horse cars and omnibuses had largely contributed to the improvement in the cleansing of the streets. The introduction into the smaller streets of the sanitary bin, instead of the old ashpit, had been attended with satisfactory results.

Sept. 10th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Bequests to Medical Charities.

THE law-agents under the will of the late Sir William Laird have intimated the following bequests: Glasgow Royal Infirmary, £2000; Glasgow Western Infirmary, £1000; Alexander Hospital, Coatbridge, £1000; and the Victoria Infirmary and Royal Hospital for Sick Children, Glasgow, each £500. The Merchants' House of Glasgow receives £1000 and a further sum of £4000 is distributed among various asylums for the blind and local convalescent homes.

Royal Philosophical Society of Glasgow.

Lord Blythswood, the president of this society, has received from Lord Balfour of Burleigh a letter intimating the King's pleasure that the society, "in respect of the near approach of the hundredth anniversary of its foundation, shall hereafter be known as the Royal Philosophical Society of Glasgow."

Hartwood Asylum Report.

In his report for 1900–1901 Dr. Campbell Clark, the medical superintendent of the Lanark District Asylum, states that during the year 205 patients were admitted, 127 were discharged, and 47 died. The increase is less than in previous years and is to a large extent explained by the admission of a number of out-country patients. The recovery rate for the year is stated at 49·3 per cent. of the admissions. The industrial employment of the patients continues to be a prominent feature of the asylum methods, the daily average of those so employed being for the males 72 per cent. and for the females 68 per cent.

The British Association.

The meeting of the British Association opens at Glasgow to-morrow (Wednesday, Sept. 11th), under the presidency of Professor A. W. Rücker.

Glasgow University.

The formal opening, on Sept. 3rd, of the James Watt Laboratory, in course of completion for the engineering department of the university, was the occasion of a somewhat imposing ceremony, the most prominent feature of which was the inaugural address delivered by Lord Kelvin. The cost of the building and equipment is expected to be something like £40,000, towards which a sum of £25,000 has been raised. Mr. James S. Dixon (Glasgow) has presented a sum of £10,000 for the endowment of a lectureship on mining. Both of these events give evidence of the success and energy with which the movement for the better equipment of the university is being prosecuted.

Sanitary Association of Scotland.

The twenty-seventh annual congress of this association has been held during the past week at Paisley, under the presidency of Dr. R. Farquharson, M.P. In his opening address the president spoke in opposition to the recent theory put forward by Dr. Koch and advocated the maintenance and extension of all measures necessary to prevent the use of milk or meat from tuberculous animals by human beings. In a paper on Reception Houses Professor J. Glaister argued for an increase in the power of local authorities to deal with persons who had been exposed to the chance of infection. Under the present regulations the power of control is very limited and needs to be increased in the public interest. Dr. A. K. Chalmers discussed the subject of the control of dairies and the supply of milk. He advocated the establishment of an annual licensing court at which the condition of the various premises could be reviewed. Referring to the question of tuberculosis Dr. Chalmers held that in all cases tuberculosis of the udder should be made notifiable. This is provided for in the Paisley Police Act, but at no other place in Scotland. In a discussion on the Duty of Local Authorities with regard to Consumption Dr. Ebenezer Duncan spoke in favour of placing phthisis pulmonalis in the list of compulsorily notifiable diseases. In dealing with the question of sanatoria Dr. Duncan expressed the opinion that the climatic conditions in this country were quite suitable for this method of treatment. In a recent tour of inspection in Germany he had seen nothing that could not readily be carried out in this country. Other papers included one on Hospital Isolation in Scarlet Fever, by Dr. J. T. Wilson, medical officer of health of Lanarkshire, and one on the Sanitary Regulations of New Buildings, by Dr. A. Campbell Munro, medical officer of health of Renfrewshire. The President-elect for next year is Professor Glaister.

Glasgow Central Dispensary.

Mr. J. Francis R. Gairdner, M.B., C.M. Glasg., has been appointed surgeon-in-charge of the department for diseases of the urinary organs, in succession to Dr. A. R. Oliver, resigned.

Sept. 10th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

The Question of Trained Nurses: Meeting of Delegates in Dublin.

THE question as regards nursing in the county infirmaries and workhouse hospitals of Ireland, with the recent action of the Local Government Board of Ireland in that connexion, has given rise to much discussion and now forms matter of great public medical interest in Dublin. Some of the most popular and so-called national daily journals have in this instance published articles in support of the action of the Local Government Board as regards the nursing in county infirmaries and union hospitals. Grave scandals have been reported in connexion with the nursing arrangements of these and reform is obviously needed. That fact is fully recognised, but on August 29th a meeting of delegates from the boards of guardians and representatives of the boards of management of county infirmaries was held in Dublin to protest against the Order of the Local Government Board of Ireland, dated July 5th, 1901, in reference to the nursing question and to suggest modifications and alterations "in accordance with the experience of the institutions represented." The chairman of the South Dublin Board of Guardians, Mr. Joseph Mooney, J.P., who presided, said that the meeting had been called together in pursuance of a suggestion contained in a resolution passed by the guardians of the Cashel Union in June last, and he remarked that he himself possessed no particular knowledge of the nursing question. Mr. O'Neill of Magherafelt moved:—

> That we consider the training monopoly enjoyed by a few hospitals is unreasonable in itself and unjust to the excluded hospitals and their officers, and to the taxpayers generally, who have been mulcted thereby in salaries out of all proportion to the circumstances of the country and to the initial expenses of the recipients.

The motion was carried. Mr. Laffan of Cashel said that there was no intention to revert to the system of untrained nurses, but that it was proposed that the small hospitals should have the same power to train three or five nurses that the large ones in Dublin had in respect of 50 or 60. The arguments advanced were much the same as those brought forward some years ago in support of the contention that the county infirmaries and union hospitals should be given the privilege of granting certificates to students of medicine and of having them duly received by the Universities and other licensing bodies. They will doubtless fail. The chairman is reported to have said that there was great looseness in the granting of certificates to nurses, some of whom could obtain their qualifying papers in one year instead of three, provided they paid sufficiently for them. This, if true, would surely be a reason why certificates of proficiency in nursing should rather be confined to the large clinical hospitals the character and efficiency of which as teaching institutions are fully recognised by the medical profession and by the public. The general opinion in Ireland, both medical and lay, is certainly that the scandals recently disclosed in connexion with nursing in the union hospitals more than justify the action taken by the Local Government Board of Ireland.

The Outbreak of Typhoid Fever in Belfast.

At a meeting of the City Corporation, held on Sept 1st, the chairman of the Public Health Committee (Alderman J. Graham, M.D. R.U.I.) made a full and candid statement in reference to the present alarming and deplorable outbreak of typhoid fever in Belfast. He drew attention to the following table which showed exactly how Belfast stood in relation to typhoid fever during the past three years:—

Month.	1899.	1900.	1901.
January ...	94	42	68
February ...	54	48	81
March	61	84	79
April	40	95	90
May	58	177	129
June	190	227	247
July	182	206	505
August ...	253	209	345
September ...	248	223	—
October ...	278	230	—
November ...	103	127	—
December ...	54	90	—

This table shows that in May, June, July, and August of this year there has been a large increase in the number of cases. The medical officer of health reported that between July 21st and August 17th 588 cases of zymotic disease had been notified, and of these 345 were typhoid fever. This is a smaller number of cases of typhoid fever than in

the preceding month and the deaths are also fewer. Alderman J. Graham takes the view that the water is to blame and bases this on the fact that in the month of February last there were two cases of typhoid fever in the Stoneyford catchment area, and he argues that despite all the filtration admittedly carried out by the Water Commissioners these cases originated the present outbreak. On the other hand, he admits that others blame the jerry-built houses, the defective drains, the ill-ventilated sewers, and the ground filled in with filthy matter as the causes of the outbreak, and under these circumstances—i.e., difference of opinion as to the origin of the disease—the Public Health Committee have decided to locate a number of experimental districts in Belfast, and to examine into every possible condition—site, elevation, different class of house, subsoil, and old and new drainage—and they have directed a full and complete examination as to the number of cases of typhoid fever therein, the condition of the sewers and drains, subsoil, and the general condition of the houses, and from the examination of the results obtained they were certain they would be able to find what part was played in the production of fever, first, by filled-in ground; secondly, a subsoil saturated with drainage matter; thirdly, by the difference of elevation above sea-level and sewer ventilation; fourthly, by defective house-drainage; and fifthly, by the substitution of water-closets for the old privy and ashpit systems. The public welcome this attempt to try to discover the causes of a disease the occurrence of which is in every way so discreditable to a modern city like Belfast. It is a pity that the Public Health Committee did not go a step further and arrange with some independent English medical officer of health to come over and direct all these investigations, so that we may at length discover once and for all why a preventable disease like typhoid fever is endemic in Belfast. The fever hospital at the union workhouse, Belfast, has all the typhoid fever wards filled at the present moment; last week there were 60 admissions, and some of the cases, even in the early stage, were very bad, severe hæmorrhage being a complication even in the beginning of the attack. On Sept. 10th there were 254 cases of typhoid fever in the fever hospital, the type of the disease showing an increased severity. Additional medical men and nurses have been appointed. On the same day 9 cases of diphtheria were admitted to the hospital.

Belfast Asylum.

At a meeting of the committee of this institution, which was held on Sept. 9th, it was decided to build two villas at Purdysburn, and that the city surveyor should be asked, subject to the approval of the Improvements Committee of the Corporation of Belfast, to submit a report on the sewerage of Purdysburn as well as that of an adjacent farm (Morrow's). This farm of 90 acres some think the authorities should purchase. The facts are that the Purdysburn estate originally consisted of 295 acres and that of these 65 acres will be rendered useless when part is taken for the proposed infectious diseases hospital, leaving 230 acres. Of these, 130 acres are in plantations, gardens, &c., leaving only 100 acres for the erection of the entire asylum of the city and for providing sites for some of the new villas; hence the importance of securing an adjacent farm of 90 acres. The real difficulty of the situation is the sewerage question.

A Question of Water-Supply at Newry.

This question, so important to any town, came before the Newry Urban Council on Sept. 9th, owing to complaints recently made that there was a deficiency of water in the higher parts of the town. At present new houses are being erected in that locality and they will require water, while old houses which have not had it before will probably be taking it, and as a result there will be a great increase in the consumption. In the principal reservoir—the Egyptian arch—there was storage for only half a day's supply. It appears that plans have been prepared for the enlargement of this reservoir, but that the difficulty is the question of the money. The matter has wisely been referred to a committee. It is hoped that the citizens of Newry will see to it that they get an adequate water-supply, as nothing is so essential for a town. Fortunately, owing to the proximity of mountains, there is an inexhaustible supply of water; all that is needed is to enlarge the reservoir (and there is ample room within the boundary of the reservoir grounds to do this) and to see that proper filter-beds are constructed.

Sept. 10th.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

A French Mission to America for the Study of Yellow Fever.

THE Chamber of Deputies and the Senate have without any discussion, and unanimously, voted a sum of 100,000 francs for the organisation and expenses of a mission to study yellow fever. The mission will consist of three or four members and will start in October next. It will be under the direction of the Pasteur Institute which will in case of need see to the supply of fresh members. The mission will if possible commence operations in Brazil.

A New Method of Studying the Course of Underground Streams.

As a rule fluorescine is the substance used for the study of the course of underground streams. But M. Berthelot has just communicated to the Academy of Sciences the details of an investigation which has enabled him to solve the vexed question of the origin of the springs of the Loue, and the material used was absinthe. The point to be decided was whether or no the springs of the Loue which flow at a rate of 15,000 litres per second were a branch of the Doubs. M. Fournier, Professor at the Faculty of Sciences of Besançon, was of opinion that they were so, but hitherto he had not been able to prove his theory. Fluorescine was tried but without result. Only recently, as a result of the enormous fire which destroyed the absinthe factories of Pernod at Pontarlier, about 1,000,000 litres of absinthe flowed into the Doubs. Two days later the cave where the Loue springs arise smelt strongly of absinthe, while a little waterfall near the springs frothed copiously. M. Berthelot, junior, who happened to be on the spot, collected some samples of water and froth which he forwarded to his father. From the water the illustrious chemist extracted a drop of essence of aniseed, while the deposit left on the filter by the froth gave an appreciable quantity of essence of absinthe. M. Fournier's theory is therefore proved to be correct and the springs of the Loue are thus seen to be merely a subterranean derivative of the waters of the Doubs. It will be as well to bear this fact in mind if ever these springs are taken up as a water-supply for a town.

The Diploma in Colonial Medicine.

To put an end to the squabble about the creation of an Institute of Colonial Medicine and where it should be the French Minister of Public Instruction has just signified his approval of a decision of the council of the University of Bordeaux founding a diploma in medicine to be given by that university. The diploma will be granted after keeping of terms and passing an examination (1) to doctors in medicine of a French university; (2) to doctors in medicine of foreign universities; and (3) to foreigners having a medical diploma which is recognised as equivalent to a French doctorate of medicine. The examination will comprise (*a*) a clinical examination in tropical pathology; (*b*) a practical examination in the demonstrations and manipulations which have been gone through during the terms; and (*c*) a *viva voce* examination upon the subjects taken up during the course of study.

The Relation of Psoriasis to Neurasthenia and its Treatment by Injections of Orchitine.

At the meeting of the Academy of Sciences held on August 12th M. Bouffé gave an account of some 200 cases of psoriasis which he had seen during the course of the last eight years. The patients had been under observation regularly for from three to six months. He considered that he was justified in coming to the following conclusions:—1. Psoriasis is a tropho-neurosis having its seat in the nervous centres and more especially in the sympathetic system. 2. It is closely allied in its origin to neurasthenia, which condition is a sequela of troubles of the cerebro-spinal system. 3. In psoriasis, as in neurasthenia, there is a diminution of nerve force which is shown by a fall in the urographic chart of the phosphoric acid curve. The curve goes as low as 15, 14, or even 12 per 100. Psoriasis is an eosinophile disease. The toxæmia which follows on the nerve disturbance manifests itself by a marked leucocytosis and the eosinophile cells both in the skin and the blood go up from

4 per cent. to 14 or 16 per cent. 4. The treatment of election which follows from the observation of both psoriasis and neurasthenia consists in stimulating the nervous system by injections of orchitine which exercises a selective act upon both the cerebro-spinal and sympathetic nervous systems. 5. The daily dose of orchitine is from 10 to 12 cubic centimetres given three times a week. In some cases the dose may be increased. 6. The duration of the treatment is three, five, or even six months, according to the nature of the case, the stage of the illness, the moral condition of the patient, and the family history.

Sept. 10th.

EGYPT.

(FROM OUR OWN CORRESPONDENT.)

The Plague.

As judged by the statistics of patients issued by the Sanitary Department every day Egypt is practically free from plague, for there are only two cases, both convalescent, at Port Said in to-day's bulletin. But for the last two or three years we have learnt to look at other things than human patients, and rats we are told are still dying in large numbers at Port Said and also at an inland town, Mit Ghamr. The plague is stayed but not ended and it will probably take another month or two to stamp it out altogether. We, here, have not yet been converted to the doctrine that it is rather the rat parasites than the rats themselves which are dangerous to man, but we all firmly believe that rats are always affected by plague synchronously with, or anterior to, man. Sporadic cases such as we have had in Egypt for the last three years are probably all due to rat contamination, whereas widespread epidemics existing to-day in India must be due to several other causes. The theory so far is this: rats infected by plague reach an uninfected town, probably from shipping on the coast-line, and we know that rats almost invariably suffer from the septicæmic form of the disease. Rat recovery is rare, and the local bubonic form in the inguinal region when present is usually accompanied by internal evidence of plague as well. It therefore happens that the excreta of a considerable number of infected rats must contain plague bacilli, and it is probably from these excreta that bare-footed natives with an unnoticed abrasion on the foot contract the disease, while the European, working side by side with them, is protected if his feet are entirely covered. The bacillus must enter by the foot or ankle because it is nearly always the femoral glands of one thigh which are affected in the bubonic cases among man. Sometimes the glands above Poupart's ligament are also enlarged, but this is apparently a secondary development. A week ago, by the courtesy of Mr. W. B. Orme, I was able to see six plague patients at the Government hospital at Port Said, being five males and one female. With one exception they, like their predecessors, belonged to the poorest native class, who spend their lives barefoot. The exception was a fairly well-to-do Egyptian, belonging to the working-classes, who vowed that he always wore leather slippers both indoors and outdoors. One of the patients was slowly recovering from a pneumonic attack following on a parotid bubo, and another boy was interesting because he was the only case this year of an axillary bubo. His trade is to clean cooking-vessels in the sand, squatting on the ground, and the bacillus had apparently entered his hand from infected earth. He was of even greater interest because he had a history of a suppurating femoral bubo in Damietta a year ago when the plague was there, and this year he most certainly had a second attack, as proved by bacteriological examination. First came the right axillary bubo, then double parotid buboes, and then his old femoral scar began to discharge pus too. There is, indeed, no ground for supposing that one attack of plague does confer immunity. The last two cases have been brought to hospital by men who claimed the recently instituted reward of 8*s.* for reporting a case. Some of the medical students have been pressed into plague work this summer and have done very well under the English inspectors.

Port Said Hospital.

The Government hospital is now being partially restored as funds permit. There are a new and more convenient out-patient department, two new wards, with laundry and other necessaries. The hospital is in much request with paying patients, and surgical cases, especially those of vesical calculus, come from a distance in large numbers to be operated upon.

Cairo, Sept. 2nd.

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

The Health of Sydney.

DR. W. G. ARMSTRONG, the medical officer of health of the metropolitan combined districts of Sydney, has presented a report for the year 1900. The corrected death-rate was 12·39 for every 1000 persons living, being exactly the same as that for the year 1899 and one of the lowest ever recorded for the metropolis. One of the most satisfactory facts about the statistical records of the year was the substantial fall in the infantile mortality. The death-rate from scarlet fever was the lowest ever recorded—viz., 0·01 per 1000. Dr. Armstrong is of opinion that the virulence of scarlet fever has undergone a remarkable modification in Sydney in recent times. The death-rate in 1876 was 2·71 per 1000. Assuming that the virulence, and in consequence the case fatality, were the same then as now, 135,000 persons must have been attacked in 1875, a manifestly absurd proposition, seeing that the total population in that year was under 170,000. Dr. Armstrong is unable to suggest any cause for the diminished virulence, but points out that the notification of infectious disease is probably not without effect on the spread of the disease, notwithstanding the facts that disinfection of dwellings is generally neglected and hospital isolation is a negligible quantity. The death-rate from diphtheria was 0·048 per 1000 living, with a fatality rate of 7·5 per cent. This was somewhat higher than the rate in 1899, but still it was lower than that recorded in previous years. Typhoid fever was more prevalent than in 1899 and was 2·2 per 1000 of population, a high rate as compared with other large cities, and especially so as the general death-rate was so much lower. It is also a striking fact that since the enforcement of compulsory notification very few outbreaks of typhoid fever in Sydney have been traceable to contamination of water- or milk-supplies or the infection from shellfish. Dr. Armstrong is of opinion that the usual source of infection in Sydney is by the dust, owing to the dryness of the climate. The upper layer of the soil in backyards, which has been saturated with all kinds of organic impurities, becomes accidentally infected by the specific typhoid organism. The first hot wind dries the surface, pulverises it, and carries the dust, to the particles of which the typhoid organisms may be attached, to any food to which it may have access. Diarrhœa depends on much the same conditions and prevails especially at the end of dry, dusty summers. Phthisis had a death-rate of 1·02 per 1000 living and tuberculosis generally a rate of 1·27, one of the lowest recorded. Since 1885 a steady and remarkable decline in the annual death-rate from tuberculous disease has occurred in Sydney, so that it is now less than half that which it was then. Nevertheless, it is still much higher than it ought to be. Dr. Armstrong recommends a modified form of notification of cases of phthisis by a special enactment which would not interfere much with the ordinary life of the notified person, but would inform the authorities of his condition and enable them to advise him as to the best means of preventing infection, and in the event of his leaving his house measures could be taken for its disinfection. Mr. Mailler Kendall, the medical officer to the Sydney Water and Sewerage Board, has submitted a report on the health of the metropolis for the quarter ending June 30th, 1901. The population had increased since the corresponding period of last year by 45,243 persons. The mortality from all causes was greater than in the same quarter of 1900. The mortality from phthisis and diarrhœa had decreased, that of the latter being less than it had been for six years. Meteorological changes might have contributed to this result. The number of cases of typhoid fever reported during the quarter was greater than the number for the corresponding quarter of last year. It was found that 33 per cent. of the cases came from dwellings unconnected with existing sewers, more than 60 per cent. came from dwellings where

the old system prevailed, more than 25 per cent. came from dwellings where the sanitary system needed reconstruction, and less than 12 per cent. came from dwellings where the Board's regulations had been complied with.

Bubonic Plague and Small-pox.

A fresh case of bubonic plague has occurred at Brisbane. The other States remain free from the disease. No further cases of small-pox have been discovered in any of the States and the contacts at the Sydney quarantine stations have been released.

Influenza.

Influenza is very prevalent in all the States, especially in Sydney and Melbourne, chiefly of a mild type. The cases in Sydney appear to be more of a catarrhal character, but in Victoria true *la grippe* with the usual nervous phenomena prevails. The winter has been very severe and there is an unusual prevalence of pneumonia and bronchitis. Both in Sydney and Melbourne the police force has been especially affected, whilst the military forces have been practically exempt.

Unusual Method of Diphtheria Infection.

In his annual report to the Newtown (Victoria) Council the health officer, Dr. J. G. Carstairs, related that four years ago a father and son who were cornet-players were attacked with diphtheria. The instrument upon which they played was put away. Recently a younger member of the family discovered the old cornet and began playing upon it and in less than a week he developed diphtheria. Previous to this case no diphtheria had occurred in the district for eight months.

Suicide of a Medical Man.

Dr. William Travers Michael Shells, aged 40 years, has committed suicide at Chatswood, New South Wales, by shooting himself through the heart with a revolver. It appears that Dr. Shells, who was recently one of the medical officers at the quarantine station during the plague outbreak, was suffering from phthisis, and latterly had been very despondent.

Obituary.

On July 22nd the oldest medical practitioner in the State of Victoria passed away in the person of Dr. Andrew Plummer of Port Melbourne, at the advanced age of 88 years. Dr. Plummer graduated at Edinburgh University in 1834 and arrived in Victoria in 1853. In 1861 he was appointed medical officer to the prison and reformatory hulks in the bay, and in 1866 of the naval training ship *Sir Harry Smith*. Dr. Plummer took a great interest in municipal affairs and was the first chairman of the Port Melbourne (then called Sandridge) Council; later the title was changed to mayor, to which position he was re-elected in 1864 and 1865. He was also a Justice of the Peace and for many years returning officer for the electoral district. He devoted his leisure to farming and breeding pure stock, particularly Lincoln and Leicester sheep, gaining many prizes at agricultural shows. He was for several years president of the National Agricultural Society of Victoria, and was also chairman of the Council of Agricultural Education and chairman of the Tuberculosis Board.—Mr. J. Rundle Cater, M.R.C.S. Eng., of the Orient Company's service, died at sea on July 7th on board the R.M.S. *Omrah*, of which he was surgeon. He was 43 years of age and died from cerebral hæmorrhage. He was a native of Plymouth and a cousin of General Sir Leslie Rundle. He was a student of St. Mary's Hospital, London, where he took several prizes, and was also a noted athlete and an enthusiastic volunteer, holding the rank of sergeant in the Artists' Rifles. He had been 16 years in the service of the Orient Company.

August 5th.

DEATH OF A CENTENARIAN.—Mrs. Ann Kingston, who died on August 31st at Moulton Chapel, six miles from Spalding, was in her 103rd year, having been born at Deeping Saint James, Lincolnshire, on Jan. 31st, 1799. She had been married three times and had had twelve children. Her parents were of the labouring class and when a young woman she worked in the fields.

Obituary.

JOHN GRIFFITH, F.R.C.S. ENG., L.R.C.P. LOND.

MUCH regret has been occasioned by the announcement of the untimely death of Mr. John Griffith at the age of 35 years. Mr. Griffith entered at St. Mary's Hospital and gained distinction as a student, obtaining in 1888 the scholarship in pathology and in the following year the prize in ophthalmology. He also held the posts of assistant demonstrator of anatomy and assistant demonstrator of pathology and curator at St. Mary's Hospital. He was admitted a Member of the Royal College of Surgeons of England in 1889 and a Fellow in 1894. Early in his career he showed a special aptitude for ophthalmic work and it was as senior clinical ophthalmic assistant that he became well known to the students of St. Mary's and formed a large circle of friends. A clear, untiring, and courteous teacher, he never spared himself, and it is not too much to say that his advice carried with it an authority that was remarkable, for his appearance was singularly youthful. His deep knowledge of the pathology of ophthalmic diseases, combined with a wide clinical knowledge and manipulative skill, justified entirely the confidence that all who knew him placed in his opinion. His charm of manner, amiable disposition, and modesty won him numerous friends. There is no doubt that he possessed mental powers and energy out of proportion to the strength of his constitution, and from a severe attack of pleurisy which occurred shortly after he had obtained his diploma dated the commencement of his gradual failure of health. At that time he was so situated that it was impossible for him to take the prolonged rest that was requisite and advised him by his medical attendants, and his hospital and private work involved a too severe physical strain. In addition to his appointment at St. Mary's Hospital he was assistant surgeon and curator to the Royal Westminster Ophthalmic Hospital and honorary ophthalmic surgeon to the Kensington Institute for the Blind. During the last five years of his life he assisted Mr. Anderson Critchett with his private work and already he had made his mark as an ophthalmic surgeon and had obtained a considerable private practice. Mr. Griffith was joint-author of the chapter upon Refraction of the Eye in the second edition of Mr. Henry Juler's text-book, "Ophthalmic Science and Practice." He also contributed several important papers to the literature of ophthalmology, and his opinion upon pathological questions especially was frequently sought by the Ophthalmological Society, of which he was a member. His most recent work was devoted to the study of gonorrhœal iritis, and he devoted especial attention to the length of time that might elapse between the attack of gonorrhœa and the inflammation of the iris.

During the whole of the present year his friends saw with deep concern that the pulmonary disease from which he suffered was gaining upon him. Though obviously becoming weaker and thinner month by month he struggled bravely on and never, even to the last, lost hope or realised, as all his friends around him had done, that his work was over. During the last month of his illness he was assiduously nursed and watched over by his friends at St. Mary's, and his death at the commencement of a brilliant career and after many years of arduous work is indeed deplorable.

HERBERT BRACEY, M.R.C.S. ENG., L.S.A.

HERBERT BRACEY was the youngest of three sons—all medical men—of Mr. Charles Bracey, a respected and well-known medical practitioner of Birmingham. He was also the last survivor of the group. He was educated at King Edward's School in Birmingham and afterwards became a medical student of Queen's College and of St. Thomas's Hospital, London. He was admitted Member of the Royal College of Surgeons of England and a Licentiate of the Apothecaries' Company in 1872. Before settling down to general practice he made some voyages in the Peninsular and Oriental Company's service. On his return he took up his father's practice which he continued to manage until a few weeks of his death. Genial and kindly in his

manner, patient and conscientious in the pursuit of his professional duties, he soon acquired the confidence and regard of a large circle of patients. He avoided any association with public affairs and had no ambition to become prominent outside his own calling. Some five years ago a small growth of suspicious character developed outside his chest which was removed successfully by a surgical friend. Until a few weeks ago his health remained good, when symptoms of mischief appeared in the colon which were followed by a fatal issue. Mr. Bracey leaves a widow. He had one son also whose medical career he just lived to see commenced at the new University of Birmingham.

DEATHS OF EMINENT FOREIGN MEDICAL MEN.—The deaths of the following eminent foreign medical men are announced:—Dr. Hermann Steinbrügge, Extraordinary Professor of Otology in Giessen.—Dr. A. A. Tokarski, *privat-docent* of Physiology, at the age of 42 years.

Medical News.

FOREIGN UNIVERSITY INTELLIGENCE.—*Bahia:* Dr. Manoel Bonifacio da Costa has been appointed professor of Clinical Odontology.—*Berlin:* Dr. Juergens, one of Professor Virchow's pathological assistants, has been granted the titular rank of Professor.—*Breslau:* Dr. Georg Reinbach has been recognised as *privat-docent* of Surgery.—*Brooklyn (Long Island College):* Dr. W. F. Campbell has been appointed to the chair of Anatomy in succession to the late Dr. M. W. Browning.—*Erlangen:* Dr. Ernst Graser of Rostock has been appointed to the chair of Surgery in succession to the late Dr. von Heineke. Dr. O. Aichel has been recognised as *privat-docent* of Midwifery and Gynæcology.—*Heidelberg:* Dr. K. Brauer, *privat-docent* of Medicine, Dr. Ferdinand Petersen, *privat-docent* of Surgery, and Dr. Siegfried Bettmann, *privat-docent* of Dermatology, have been promoted to extraordinary professorships.—*Leyden:* Dr. Korteweg of Amsterdam has been appointed to the chair of Clinical Surgery in succession to the late Dr. J. E. van Iterson.—*Pisa:* Dr. D. Bossalino has been recognised as *privat-docent* of Ophthalmology and Dr. P. Pellegrini as *privat-docent* of Experimental Hygiene.—*Rostock:* Dr. Richard Greef of Berlin has been appointed to the chair of Ophthalmology in succession to Dr. Axenfeld who is migrating to Freiburg.—*Rome:* Dr. Claudio Della Valle has been recognised as *privat-docent* of Microscopic Anatomy and Dr. A. Dionisi as *privat-docent* of Pathological Anatomy.—*Zürich:* Dr. Friedrich Goll, Extraordinary Professor of Pharmacology, is about to retire at the age of 72 years. His name is known to all anatomical students in connexion with the columns of the spinal cord. His successor is Dr. Max Cloëtta. Dr. Sidler-Huguenin has been recognised as *privat-docent* of Ophthalmology.

BEQUESTS AND DONATIONS TO HOSPITALS.—The Dental Hospital of London, Leicester-square, W.C., has received the sum of £500 from the executors of the late Mr. Richard Bowerman West.

VACCINATION EXPENDITURE.—The vaccination expenditure of the Bristol Board of Guardians for the year ended March 25th, 1899, amounted to £322; for the years ended March, 1900 and 1901 the cost was £1295 and £1394 respectively.

BRISTOL GENERAL HOSPITAL.—The half-yearly general meeting of the governors of this institution was held on Sept. 9th under the presidency of Mr. Proctor Baker. The chairman stated that the receipts from subscriptions and donations had varied very little from the corresponding period of last year; there was an increase of £116 in the amount received from collections at places of worship and £5302 had been received from legacies. There was a decrease of £207 on the ordinary expenditure. Mr. Baker added that the electric light had been introduced at a cost of £800 and a new lift and steam boiler had been added at a cost of £600 and £579 respectively. It was reported that Sir W. H. Wills had promised to be responsible up to £600 for the introduction of the Finsen treatment by means of light. A resolution was unanimously passed expressing the board's deep sense of the loss which the hospital has sustained in the sudden death of the late Dr. Aust Lawrence.

THE CONFECTIONERS', BAKERS', AND ALLIED TRADERS' EXHIBITION.—The ninth annual exhibition of the confectioners, bakers, and allied trades was held in the Royal Agricultural Hall from Sept. 7th to 14th. The exhibition was attended by a great number of persons representing the various trades as well as by a large number of food experts. The exhibits were of a most interesting and varied kind, comprising working models of biscuit factories, machine bakeries, bread-making machinery of all sorts, machinery for sweet-making, and the thousand-and-one accessories incidental to the baking trade. Milk products were also a feature of the show. A number of cooking competitions were held in bread-, pastry-, and confectionery-making, the prize-winning products being exposed for inspection. Seldom is a more interesting or greater array of novel machinery and appliances to be seen in the Agricultural Hall than on this occasion, and it is satisfactory to find that in spite of roller-milled flour energy and skill are also being directed to the production of flour and bread of a high standard of nutritive quality.

BOOKS, ETC., RECEIVED.

BAILLIÈRE, TINDALL, AND COX, 8, Henrietta-street, Strand, W.C.
A Handbook of Diseases of the Nose and Pharynx. By James B. Ball, M.D. Lond. Fourth edition. Price 7s. 6d.

BLACKWOOD, WILLIAM, AND SONS, Edinburgh and London.
The Life-history of British Serpents, &c. By G. B. Leighton M.D. Edin., &c. Price 5s.

CASSELL AND CO., Limited, London, Paris, and New York.
Advice to Women. By Florence Stacpoole. Third edition, Price 2s.
Surgical Applied Anatomy. By Sir Frederick Treves, K.C.V.O., C.B., F.R.C.S. Eng. New edition, revised by the Author with the assistance of Arthur Keith, M.D. Aberd., F.R.C.S. Eng. Price 9s.

CHURCH MISSIONARY HOUSE, Salisbury-square, E.C.
Preaching and Healing: the Report of the C.M.S. Medical Mission Auxiliary for 1900-1901. Price not stated.

FISCHER, GUSTAV, Jena.
Die Malaria. Studien eines Zoologen. By Battista Grassi. Price 20 marks.
Zur Lehre von der Blutzirkulation in der Schädelhöhle des Menschen, namentlich unter dem Einfluss von Medikamenten. By Dr. Hans Berger. Price 5 marks.

LEWIS, H. K., 136, Gower-street, W.C.
The Sanitary Inspector's Handbook. By Albert Taylor, Mem.San.Inst., &c. Third edition. Price 6s.

MASSON ET CIE, Paris.
XIII. Congrès International de Médecine, Paris, 1900. Section d'Obstétrique, Proceedings published by Messrs. Bar and Champetier de Ribes, Secretaries of the Section; Section de Gynécologie, by M. Hartman, Secretary of the Section. Price 5 francs.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, for publication in the next number.*

ALLEN, WILLIAM T. D., M.B. R.U.I., has been appointed a District Medical Officer of the Parish of Liverpool.

ANDERSON, WM. A., M.B., C.M. Edin., has been appointed Assistant Medical Officer to the Plymouth Borough Asylum, Ivybridge, Devon, vice Dr. Heywood Radfield, resigned.

ANDREW, HENRY, L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer to the Exeter Royal Albert Memorial College.

ANDREWS, WILLIAM H., L.R.C.P., L.R.C.S. Edin., L.F.P.S. Glasg., has been re-appointed District Medical Officer of the Kingsbridge Union.

BRODRICK, CHARLES C., L.R.C.P., L.R.C.S. Edin., has been re-appointed Medical Officer of Health of Tavistock.

BROWN, JOHN, M.D. Viet., D.P.H., has been re-appointed Medical Officer of Health for the Borough of Bacup.

CLARKE, ASTLEY VAVASOUR, M.D., B.C. Cantab., has been appointed Physician to the Leicester Infirmary and Fever House, vice J. Headley Neal, deceased.

COMPTON, ALWYNE T., M.R.C.S. Eng., L.R.C.P., has been appointed Second Assistant Medical Officer to St. Mary, Islington, Infirmary, Highgate-hill, N.

DAKIN, THOMAS B., M.R.C.S. Eng., L.R.C.P. Lond., has been appointed District Medical Officer of the Glanford Brigg Union.

GORNALL, J. GUEST, M.A., M.B., D.P.H. Cantab., has been appointed Medical Officer of Health of the County Borough of Warrington.

HALLAM, A. R., M.B., Ch.B. Edin., has been appointed Junior Assistant House Surgeon of the Sheffield Royal Infirmary.

HASWELL, N. RICHARD, M.R.C.S. Eng., L.S.A., has been re-appointed Medical Officer of Health of the Helston Rural District Council.

HIPWELL, HARRY, M.D. Brux., M.R.C.S. Eng., L.R.C.P. Lond., has been appointed District Medical Officer of the Banbury Union.

HOUSLEY, JOHN, M.D, St. And., M.R.C.S. Eng., has been re-appointed Medical Officer of Health of Retford.

JOSCELYNE, E. W., M.B. Durh., has been appointed Surgeon to the Taff Vale Railway, vice R. C. Hunter, deceased.

JONES, OWEN C., M.B. Oxon., M.R.C.S. Eng., L.R.C.P. Lond., has been re-appointed District Medical Officer of the Barnstaple Union.

PEAKE, ARTHUR E., M.R.C.S. Eng. L.R.C.P. Lond., has been appointed District Medical Officer of the Henley Union.

STEVENSON, ROLAND A., L.R.C.P. Lond., M.R.C.S. Eng., has been appointed Junior Resident Medical Officer at the London Open-air Sanatorium, Pinewood, Berkshire.

TROUP, JAMES, M.B., C.M. Aberd., has been appointed District Medical Officer of the Bury Union.

WHITTINGHAM, GEORGE M. Y., M.R.C.S. Eng., L.R.C.P. Lond., has been appointed an Assistant Medical Officer of the Wandsworth and Clapham Union.

WILLIAMS, WILLIAM GEORGE, M.B., C.M. Edin., has been appointed Honorary Anæsthetist to the Cardiff Infirmary.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BETHNAL GREEN INFIRMARY.—Assistant Medical Officer. Salary £80 per annum, with furnished apartments, board, and washing.

BRADFORD ROYAL INFIRMARY.—House Physician, unmarried. Salary £100 per annum, with board and residence.

BRIGHTON, HOVE, AND SUSSEX THROAT AND EAR HOSPITAL, Church-street, Queen's-road, Brighton.—Non-resident House Surgeon for six months, renewable. Salary at rate of £75 per annum.

BRISTOL GENERAL HOSPITAL.—Assistant House Physician. Salary £70 per annum, with board, residence, &c.

BRITISH MEDICAL TEMPERANCE ASSOCIATION.—Assistant Secretary, Salary £150 and fees, with board and residence.

CHESHIRE COUNTY ASYLUM, Parkside, Macclesfield.—Junior Medical Officer, unmarried. Salary £130, rising to £150, with apartments, board, washing, and attendance.

CHILDREN'S HOSPITAL, Forest House, Nottingham.—House Surgeon (unmarried) for six months, eligible for re-election. Salary at rate of £100 per annum, with board and residence.

CITY FEVER HOSPITAL, Lodge-road, Birmingham.—Assistant Medical Officer. Salary £120 per annum, with board, residence, &c.

CITY ASYLUM, BIRMINGHAM.—Junior Assistant Medical Officer, unmarried. Salary £150 a year, with board, apartments, and washing.

CORNWALL COUNTY ASYLUM, Bodmin.—Junior Assistant Medical Officer, unmarried. Salary £120, rising to £150, with board, furnished apartments, &c.

COUNTY ASYLUM, Burntwood, near Lichfield.—Junior Assistant Medical Officer, unmarried. Salary £150 per annum, increasing to £200, with board, lodging, and washing.

COUNTY ASYLUM, Mickleover, Derby.—Senior Assistant Medical Officer. Salary £130, rising to £150 per annum, with furnished apartments, board, washing, and attendance.

DENBIGHSHIRE INFIRMARY, Denbigh.—House Surgeon. Salary £100, with board, residence, and washing.

EAST RIDING OF YORKSHIRE.—County Medical Officer of Health. Salary £400 per annum, rising to £500, with allowances.

ESSEX COUNTY ASYLUM, Brentwood.—Junior Assistant Medical Officer. Salary £140 per annum.

GLASGOW EYE INFIRMARY.—Resident Assistant House Surgeon. Salary £75, with apartments and board.

GUY'S HOSPITAL MEDICAL SCHOOL.—Gordon Lecturer in Experimental Pathology. £250 per annum.

HORTON INFIRMARY, Banbury.—House Surgeon and Dispenser. Salary £80 per annum, with board and lodging.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—Resident House Physicians for six months. Honorarium of £25 for that period.

HOSPITAL FOR WOMEN, Liverpool.—House Surgeon for six months. Honorarium £25.

HOSPITAL FOR WOMEN, Soho-square.—Clinical Assistantships.

LONDON HOSPITAL, Whitechapel, E.—Surgical Registrarship. Salary £100 per annum.

MACCLESFIELD GENERAL INFIRMARY.—Senior House Surgeon. Salary £100, with board and residence.

NEW HOSPITAL FOR WOMEN.—Senior Clinical Assistant (female); also Clinical Assistants (female).

NORTH WALES COUNTIES LUNATIC ASYLUM, Denbigh.—Second Assistant Medical Officer. Salary £120 per annum, rising to £160, with board, residence, and washing.

NOTTINGHAM GENERAL HOSPITAL.—Assistant House Physician. Salary £100, with board, lodging, and washing.

OWENS COLLEGE, Manchester.—Junior Demonstrator in Physiology. Stipend £100, rising to £150 per annum.

PADDINGTON INFIRMARY.—Clinical Assistant and Second Assistant, unmarried, for six months. Honorarium £26, with board, lodging, and washing.

POPLAR AND STEPNEY SICK ASYLUM DISTRICT.—Second Assistant Medical Officer. Salary £100 per annum, with rations, furnished apartments, and washing.

POPLAR HOSPITAL FOR ACCIDENTS, Poplar, E.—Assistant House Surgeon for six months. Salary at rate of £80 per annum, with board and residence.

ROYAL BERKSHIRE HOSPITAL.—Assistant House Surgeon. Salary £50 per annum, with board, lodging, and washing.

ROYAL LONDON OPHTHALMIC HOSPITAL, City-road.—Curator and Librarian. Salary £120.

ROYAL SEA BATHING HOSPITAL, Margate.—Resident Surgeon. Salary £120 per annum, with board and residence.

SAINT BARTHOLOMEW'S HOSPITAL, Rochester.—Assistant House Surgeon. Salary £100 per annum, with board, washing, &c.

SHEFFIELD ROYAL HOSPITAL.—Junior Assistant House Surgeon, unmarried. Salary £50 per annum, with board, washing, and lodging.

SOMERSET AND BATH LUNATIC ASYLUM, Cotford, Taunton.—Assistant Medical Officer. Salary £120 per annum, rising to £150, with furnished apartments, board, and washing.

TAUNTON AND SOMERSET HOSPITAL, Taunton.—Resident Assistant House Surgeon for six months. Salary at the rate of £80 per annum, with board, lodging, and washing.

VICTORIA HOSPITAL, FOLKESTONE.—House Surgeon. Salary £100 per annum, with board, residence, and laundry.

VICTORIA HOSPITAL FOR CHILDREN, Queen's-road, Chelsea, S.W.—House Surgeon for six months. Honorarium of £25, with board and lodging.

WANDSWORTH AND CLAPHAM UNION INFIRMARY, St. John's-hill, S.W.—Junior Assistant Medical Officer. Salary £70 per annum, with board, lodging, and washing.

WESTERN GENERAL DISPENSARY Marylebone-road.—Second House Surgeon. Salary £80 a year, with board, residence, and laundry.

WORCESTER COUNTY ASYLUM, Powick, near Worcester.—Third Assistant Medical Officer. Salary £120 per annum, increasing to £140, with board, residence, &c.

Births, Marriages, and Deaths.

BIRTHS.

CHATTERTON.—On Sept. 3rd, at Upper Westbourne-terrace, W., the wife of Edgar Chatterton, M.R.C.S., L.R.C.P., of a son.

DANCY.—On Sept. 3rd, at Cathcart-road, Redcliffe-gardens, South Kensington, the wife of Horace M. Dancy, M.D., of a son.

ELLIOT.—On Sept. 9th, at Warwick-square, S.W., the wife of Norman B. Elliot, M.D., M.R.C.P. Lond., barrister-at-law, of a son.

HALL.—On Sept. 8th, at Elstowe House, Itchen, Southampton, the wife of Edmund S. Hall, M.B. Lond., M.R.C.S., L.R.C.P., of a daughter.

HEWITT.—On Sept. 8th, at Queen Anne-street, Cavendish-square, the wife of Frederic W. Hewitt, M.D., of a son.

HUDSON.—On Sept. 1st, at Wynberg, Cape Town, the wife of Arthur Ainslie Hudson, M.D., F.R.C.S. Edin., of a daughter.

MATTHEWS.—On August 27th, at Holly Lodge, Crawley, the wife of Sidney Matthews, M.R.C.S. Eng., L.R.C.P. Lond., of a son.

MCCLYMONT.—On the 4th inst., at 194, High-road, Leyton, Essex, the wife of John McClymont, M.D., of a daughter.

NEWINGTON.—On August 26th, at The Croft, Eden Bridge, Kent, the wife of C. W. H. Newington, M.R.C.S., L.R.C.P., of a daughter.

WHITEHALL-COOKE.—On Sept. 4th, at Higham Ferrers, Cricklewood, N.W., the wife of Cecil Whitehall-Cooke, M.D. Lond., M.R.C.S, Eng., L.R.C.P. Lond., of a son.

MARRIAGES.

BARNES—TOOTH.—On the 10th inst., at St. James', Norlands, by the Rev. Arthur Tooth, assisted by the Rev. Cyril W. Emmet, Clifford Henry, youngest son of John M. Barnes of Morningthorpe, Norfolk, to Winifred Helen, second surviving daughter of the late Robert Tooth, formerly of Yengaric, Queensland.

FORTUNE—KENNEDY.—At Glasgow, on the 6th inst., Ernest George Fortune, M.B., C.M., F.R.C.S.E., to Sophia Farley, fourth daughter of Thomas Kennedy, Esq.

HALL—GILMORE.—On Sept. 5th, at St. Mary's, Great Baddow, by the Rev. A. C. Colley, E. George Hall, M.B. Lond., to Ethel Mary, daughter of the late Rev. John Gilmore, M.A.

MACARTNEY—FISHER.—On Sept. 7th, at St. Margaret's, Lee, by the Rev. H. A. Moore, M.A., Edward Kendrick Macartney, M.R.C.S., L.R.C.P., to Eleanor Maud, daughter of Frederick Fisher.

MALLAM—CLAYTON.—On Sept. 5th, at Ilburton parish church, by the Rev. Benjamin Mallam, Harry Guy Mallam, M.R.C.S., L.R.C.P., to Alice Mary, daughter of Charles Clayton.

MILLER—GILBERT.—On Sept. 7th, at the Church of St. John the Baptist, Kingston-vale, Putney, by the Rev. Herbert S. Swithinbank, M.A., G. W. Miller, M.B., Ch.B., to Louie, daughter of H. Gilbert.

SMITH—MACNAB.—On Sept. 5th, at George-lane Congregational Church, South Woodford, by the Rev. Thomas Hammond, John Smith, M.B., M.R.C.S., to Christina, daughter of John Macnab.

SNELL—GREEN.—On Sept. 4th, at St. Anne's Church, Eastbourne, by the Rev. Thomas Myers and Rev. Charles Myers, uncles of the bride, and the Rev. W. Jay, vicar of the parish, Sidney H. Snell, M.D., B.S. Lond., D.P.H., &c., of Wandsworth Common (late of Scarborough), to Emily Hilda, only child of the late William Green of Durham.

DEATHS.

HOLLAND.—On Sept. 3rd, at Cheadle, Cheshire, Joseph Holland, F.R.C.S. Eng., aged 88 years.

HOSFORD.—On August 30th, at Hastings, John Stroud Hosford, L.R.C.P. Edin.

LIVETT.—On August 28th (the eighty-seventh anniversary of his birth), at Wells, Somerset, Henry William Livett, M.D., L.R.C.P. Edin.

ROBERTS.—On Sept. 8th, at 23, Peel-square, Bradford, William Lake Roberts, M.R.C.S. Eng., in his 56th year.

THUDICHUM.—On Sept. 7th, at Pembroke-gardens, Kensington, John Louis William Thudichum, M.D., F.R.C.P., M.R.C.S., aged 72 years.

TRACY.—On Sept. 10th, at Crescent-road, Alverstoke, Hants, Samuel John Tracy, M.R.C.S., L.R.C.P., aged 88 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

"THE METHODS OF A PUBLIC VACCINATOR."

IN our issue of August 17th we commented upon the action of a certain public vaccinator in a certain district who was, and we may now say is, in the habit of inclosing a circular from himself, together with the official notice of "intended visit," to the parent or other person having custody of a child. The circular which we previously quoted was dated May 16th; the one which we have just received is dated, in pencil, August 31st, a date which was not put on by the patient to whom the circular was sent. It is presumable then that the public vaccinator is still impenitent and continues to send out the circular in question. We reprint it a second time:—

"August 31st.

Dear Madam,—As vaccination medical officer of this district I must ask you to give your earnest and best attention to your little one's case.

The new Act is rich in blessings, proved by the following important facts, which I will explain in a few simple words.

1st. The calf lymph from Government is so carefully selected and tested that its *purity is absolutely guaranteed*.

2nd. The comforts and convenience of the mother are *assured* by the medical officer attending the home and arranging the *almost painless operation in less than two minutes*, with strict regard to gentleness and sanitation.

3rd. Visits, posting certificates to the authorities, and *securing* the mother from future trouble *free of all cost*.

I am very anxious with regard to this grave duty which you and all of us owe to our families, and the public—namely, *protection* from one of the most contagious, deadly, and repulsive diseases, the horrible plague of small-pox.

I am, dear madam, sincerely yours,
——, M.D., M.R.C.S., L.S.A."

We can only repeat our opinion that this is an improper document for a public vaccinator to circulate. It is the duty of a public vaccinator to try to secure that his district be properly vaccinated, but this does not imply that he should try to get all the vaccination cases into his own hands.

LITERATURE OF BACTERIOLOGY.

DR. AR. T. G. FILTSOS, of 16, Epeiros-street, Athens, writes inquiring as to books on bacteriology published in English. He also asks for information as to periodicals on bacteriology published in English and where they can be obtained.

**** Sternberg's "Bacteriology" (J. & A. Churchill, Great Marlborough-street, London, 24s.) and Crookshank's "Textbook of Bacteriology" (H. K. Lewis, Gower-street, London, 21s.) are the best and most comprehensive modern works. Among the many excellent works of a smaller size reference may be made to Muir and Ritchie's "Manual of Bacteriology" (Young J. Pentland, West Smithfield, London, 12s. 6d.), Thoinot and Masselin's "Outlines of Bacteriology," translated by Symmers (Griffin and Co., Exeter-street, Strand, London, 10s. 6d.), Curtis's "Practical Bacteriology" (Longmans, Green, and Co., London, 9s.), Klein's "Micro-Organisms and Disease" (Macmillan and Co., St. Martin's-street, London, 10s. 6d.), and Levy and Klemperer's "Clinical Bacteriology," translated by Ebner (W. B. Saunders and Co., 161, Strand, London, 12s.). The *Journal of Pathology and Bacteriology* is published by Young J. Pentland, 33, West Smithfield, London.—ED. L.

THE "BOOM" IN SANATORIA.

To the Editors of THE LANCET.

SIRS,—I have read with great interest the address of Sir J. Crichton-Browne on the "Treatment of Tuberculosis in Sanatoria," appearing in THE LANCET of August 24th. As I have been under the necessity of making a sojourn at Nordrach, and have also seen a few of the English sanatoria, I can more than endorse his caution to medical men in the selection of a sanatorium for their patients. It seems to be a common fallacy that any man who is qualified to sign a "D.C." is competent to manage a sanatorium. But one has only to inspect some of the situations selected to find out the inexperience of the men who conduct them. Sir J. Crichton-Browne has done a real service in drawing attention to the limited companies and the lay speculators who attempt to treat the affluent classes. There is no doubt that the whole treatment stands in grave danger of becoming discredited through being exploited by incompetent speculaters, medical and non-medical. In point of fact, I happen to know of more than one medical man who, having floated a company and then finding out there was more required than merely running a boarding-house, wrote to Nordrach imploring to be taken for a month or two to learn the rudiments and routine of the treatment; yet each new one that appears professes to run his place on strictly Nordrach lines! I therefore advise all medical men in selecting a sanatorium for their patients to examine carefully the situation, which is of immense importance in producing the best results, and also to inquire as to the experience of the medical head in the treatment, as otherwise much valuable time and money may be wasted in cases which under more intelligent management and a more favourable situation are quite amenable to treatment. I have seen several examples of such cases. In conclusion, I may say I have no connexion with any sanatorium.

I am, Sirs, yours faithfully,
August 26th, 1901. X.

TOUTING FOR PATIENTS.

A CORRESPONDENT sends us a card which we reproduce below, with the information that it was handed to him by a patient as having been left at her house a few days previously, and that similar cards had been left at adjoining houses. A reference to the Medical Directory for 1901 shows that 304, Walworth-road is in the occupation of Mr. E. W. Councell, L.S.A. 1887, M.R.C.S. 1892. Our correspondent informs us that Dr. Staines died last April. There is, however, no practitioner of that name at the address of 314, Walworth-road given in either the current Medical Register or Medical Directory.

304, WALWORTH ROAD.

In consequence of the death of Dr. Staines (late of 314, Walworth Road), Patients will now be seen at No. 304 (corner of Sutherland Street) at the following hours:—

Morning 9 to 10, and 12 to 1.30 p.m.
Evening 6 to 9. Sunday 8 to 9 p.m.
For Women only: *Monday, Wednesday, and Friday*
Afternoons from 2 to 4 o'clock.

Medicine, 6*d*. One week's Medicine, 1*s*.
Visit and Medicine from 1*s*. One week, from 3*s*. 6*d*.
MIDWIFERY. Vaccination with Calf Lymph.

PLEASE BRING THIS CARD.

The occupant of 304, Walworth-road must know perfectly well that it is not the custom of the members of the medical profession to leave touting cards at the houses of other practitioner's patients, or, indeed, at any house, and the insinuation that the occupant of 304, Walworth-road has succeeded to the patients of the late occupant of 314, Walworth-road is on the face of it not justified. Perhaps Mr. Councell will explain.

THE LONDON OMNIBUS.

To the Editors of THE LANCET.

SIRS,—Now that the public has been made aware that phthisis is chiefly contracted by direct infection from man to man, and considering that influenza and ordinary colds are similarly conveyed, no more appropriate season could be chosen for taking steps to remedy the ill-ventilated London omnibus, so that, by next summer at any rate, this source of public danger may be abolished. Obviously the windows should be made to slide down and the frames fitted with rubber pads to avoid rattling.

The Berlin summer omnibus has no windows, the roof resting on pillars, and canvas curtains, which are unfurled whenever necessary, are found to give sufficient protection against sun, wind, or rain.

The St. Louis street cars are now coming into general use in Berlin. They are "convertible," every frame containing a well-fitting window and a discontinuous wooden blind, each or both of which can be raised or lowered at pleasure.

A change of this sort would be all in favour of the omnibus companies, for during the hot weather the omnibuses which at present are full outside but empty within would be full both in and out. In winter the case is far more difficult and the only scientific solution—forced ventilation by warmed air—would necessitate a great change in omnibus construction. In default of this there remains a solution which is equally applicable to railway travel, that all persons who are susceptible to draught should provide themselves with suitable wraps and rugs.

I am, Sirs, yours faithfully,
ALFRED C. JORDAN, M.B., B.C. Cantab.
St. Bartholomew's Hospital, August 21st, 1901.

B. B. G.—Undoubtedly the woman who has put such a construction on our correspondent's actions has been guilty of slander, but it would be well before any steps are taken in the matter to ascertain whether the damaging nature of her words can be proved. Of course, "B. B. G." can only proceed under the guidance of a solicitor. Our advice is that he should write out a clear story of the case; that he should obtain from X a statement that two months ago he was engaged to attend her in her confinement; and another statement from the medical colleague who reduced the hernia setting out that in the circumstances he had done all that was necessary before being compelled to hand over the case. The story might be sent to the libellous neighbour with a warning from the solicitor of the consequences that will follow upon further misrepresentation.

Medicus.—The practice is new to us. Will the author think over the advisability of publishing the note? On the one hand he may give his medical colleagues a useful warning, but on the other he may give the public dangerous information, for we cannot guarantee that no member of the public would read his communication in our pages.

W. G.—We do not know of any book that can be recommended, but the information is the sort that a layman might very well seek from his medical attendant. We do not publish the letter because to do so is to invite sending to this office a heap of filthy publications.

Legiococcus.—We are not aware that any court or jury has preferred the evidence of a bone-setter to that of a registered medical practitioner. If such a case has occurred in our correspondent's experience we should be obliged by receiving the details.

Sceptic.—We know nothing of the treatment other than can be gleaned from advertisements and pamphlets, but advertised secret remedies carry their own condemnation.

ERRATUM.—In the paper on Naphthalene by Dr. R. P. White and Dr. John Hay, published in THE LANCET of August 31st, p. 583, col. i., line 4, the word "nitrotoluene" should be *dinitrotoluene*.

During the week marked copies of the following newspapers have been received:—*Retford, Gainsborough, and Worksop Times, St. Pancras Gazette, Leeds Mercury, Malta Times, Lisburn Herald, Indian Municipal Journal, Tyrone Courier, Liverpool Daily Post, Yorkshire Post, Mining Journal, Surrey Advertiser, Reading Mercury, Windsor and Eton Express, Malvern Advertiser, Public Health Engineer, Liverpool Courier, Driffield Observer, Beverley Recorder, Essex County Standard, Richmond Herald, Richmond and Twickenham Times, Bristol Mercury, Kent and Sussex Courier, Alloa Advertiser, &c.*

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Sept. 12th, 1901.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radiation in Vacuo.	Maximum Temp. in Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks at 8.30 A.M.
Sept. 6	29·85	E.	...	100	66	50	51	55	Overcast
,, 7	29·94	E.	...	109	71	53	55	58	Overcast
,, 8	29·90	WSW	...	116	77	58	60	61	Fine
,, 9	29·93	S.W.	0·47	112	72	61	61	64	Cloudy
,, 10	29·94	S.W.	...	109	73	57	57	58	Overcast
,, 11	29·98	W.	...	91	64	55	56	60	Fine
,, 12	30·00	N.W.	0·03	84	65	55	56	59	Dull

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY (16th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (2 P.M.), St. Mary's (2.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynæcological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.), City Orthopædic (4 P.M.), Gt. Northern Central (2.30 P.M.) West London (2.30 P.M.), London Throat (2 P.M.).

TUESDAY (17th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M. and 6 P.M.), Royal Ear (3 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.).

WEDNESDAY (18th).—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), King's College (2 P.M.), St. George's (Ophthalmic, 1 P.M.), St. Mary's (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Gt. Ormond-street (9.30 A.M.), Gt. Northern Central (2.30 P.M.), Westminster (2 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M.), Cancer (2 P.M.), Throat, Golden-square (9.30 A.M.).

THURSDAY (19th).—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (1.30 P.M.), St. Mary's (2.30 P.M.), Soho-square (2 P.M.), North-West London (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (Gynæcological, 2.30 P.M.), Metropolitan (2.30 P.M.), London Throat (2 P.M.), St. Mark's (2 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.).

FRIDAY (20th).—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.), St. Mary's (2 P.M.), Ophthalmic (10 A.M.), Cancer (2 P.M.), Chelsea (2 P.M.), Gt. Northern Central (2.30 P.M.), West London (2.30 P.M.), London Throat (2 P.M. and 6 P.M.), Samaritan (9.30 A.M. and 2.30 P.M.), Throat, Golden-square (9.30 A.M.).

SATURDAY (21st).—Royal Free (9 A.M. and 2 P.M.), London (2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), University College (9.15 A.M.), Charing-cross (2 P.M.), St. George's (1 P.M.), St. Mary's (10 P.M.), London Throat (2 P.M.), Throat, Golden-square (9.30 A.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

MONDAY (16th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Dr. J. Galloway: Clinique. (Skin.)

TUESDAY (17th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Dr. J. B. Squire: Clinique. (Medical.)

WEDNESDAY (18th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. Johnson Smith: Clinique. (Surgical.)

THURSDAY (19th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. Hutchinson: Clinique. (Surgical.)

FRIDAY (20th).—MEDICAL GRADUATES' COLLEGE AND POLYCLINIC (22, Chenies-street, W.C.).—4 P.M. Mr. R. Lake: Clinique. (Ear.)

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